

# Facts about Cycling in the Netherlands



Including Appendice: Facts about  
Walking in the Netherlands



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## Preface

The Netherlands is a true cycling country. The Dutch have been cyclists from time immemorial. In the nineteen-nineties the project 'Dutch Bicycle Master Plan' contributed to the promotion of cycling and at the same time increased the safety and attractiveness of cycling. After the 'Dutch Bicycle Master Plan' project was completed there remained a major demand for information on cycling.

The brochure 'Facts on cycling in The Netherlands' (including appendix on walking) provides as accurate picture as possible of the situation. This includes the most recent figures on pedestrian and bicycle traffic in The Netherlands that are in fact derived from the 1999 study, 'Onderzoeksverplaatsingsgedrag' (OVG) [Study of Travel Movements]. This brochure is a sequel to the brochure: 'Walking and cycling, good for municipal policy', in which arguments are presented for decentralized governments. The figures from the two brochures do not correspond on all points because the methodology used for measurement differs. The argument brochure moreover employs OVG figures from 1998.

Employees and officials of decentralized government agencies can draw upon the factual material and figures and the theoretical underpinning here. These figures can be used in supporting choices for non-motorized transport. They can also be used in project presentations, both internally to other departments and externally to lobby groups and project developers.

Abroad too there is interest in cycling in The Netherlands. It is for this reason that an English brochure has been published.

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*Knowledge Platform VERDI*

## 1. Introduction

Traffic and transport in The Netherlands has changed dramatically in recent decades. Ever increasing numbers of people are travelling more frequently over greater distances. The automobile has placed distant destinations within easy reach. The increase in mobility is also mainly due to the increase in the number of automobile-kilometres. This phenomenon is seen in practically every Western country.

Increased automobile use has a number of undesirable side effects such as the demand on space, the emission of harmful substances and traffic nuisance, such as for example noise. The automobile with its speed also presents a danger to road safety, particularly for vulnerable road users such as pedestrians and cyclists.

Nevertheless, despite the increased use of the automobile the bicycle continues to fulfil an important function in the travel pattern. The bicycle is for example used for more trips than public transport. These are mainly trips over short distances (to about 7.5 km). For these distances the bicycle is an ideal mode of transport due to its great flexibility. Approximately half of all automobile trips also involve short trips. The bicycle can in principle replace a major share of these trips and in so doing make a major contribution to reducing the use of the automobile.

In this publication Facts on Cycling (including appendix walking) you will find in the following order:

- information on recent national developments in the area of traffic and transport as context for cycling policy in The Netherlands (chapter 1);
- general national information that relates strongly to traffic and transport (chapter 2);
- information on the development of bicycle ownership relative to ownership of other modes of transport and the availability of public transport, and information on the infrastructure for cyclists and other road users (chapter 3);
- information on the use of the bicycle relative to other modes of transport (chapter 4);
- information on the undesirable social side effects of traffic and transport relative to the bicycle (chapter 5).

Appendix I provides separate information on walking as principal mode of travel, as access to and from other principal modes of transport. The relation between walking as principal mode of travel and road safety.

## 1.1 The Development of the Traffic and Transport Policy

The National traffic and transport plan (NTTP), that is currently still at the draft stage, will exhibit a clear shift from the Second Transport Structure Plan (STP II). The conclusion of STP II was that automobile traffic was growing so rapidly that it was no longer desirable to meet this demand. It was estimated that the number of automobile-kilometres would increase between 1986 and 2010 by 70%. This would jeopardize quality of life and accessibility. STP II was for this reason directed towards restricting the anticipated use of automobiles. Public transport and the bicycle would have to acquire a larger share in mobility.

During the year that the STP II policy was implemented it became clear that reducing the growth of the number of automobile-kilometres to 35% would not be that simple. There are moreover major benefits associated with increased mobility. The draft NTTP acknowledges that. This plan admits that mobility (including automobile mobility) is part of modern society and will continue to grow in the coming years. The government, besides accommodating this trend, wants to improve the safety and quality of life.

Urban and rural planning policy is designed to address the principle of restriction of demand for mobility. Until the nineteen-seventies it was customary to develop commuter cities and to separate living, work and recreation. National urban and rural policy (as also formulated in the Fourth Policy Document on Physical Planning Plus) now focuses on coherence in existing urban areas, with the realization of housing near to existing cities and the building up of railway station environments. In this way travel distances can remain restricted. The so-called location policy tries to match the locations as well as possible to the type of business. It is not known to what extent these principles will be adopted in the Fifth Policy Document on Physical Planning to be presented in 2001.

## 1.2 The National Traffic and Transport Plan (NTTP)

The main objective of the NTTP is stipulated as being the creation of an effective, safe and long-term traffic and transport system accessible to all. This objective is predicated on three principles: accessibility, safety and quality of life.

The ambition for accessibility is that the quality of the infrastructure is of high international standard and that citizens and businesses have a high regard for it. What is important in this connection is that the user is expected to pay proportionate to his use of the infrastructure when that infrastructure is scarce. The bicycle is deemed to be a significant mode of transport for shorter distances.

When it comes to safety the plan formulates a number of qualitative objectives. In addition to a reduction of the number of casualties in road traffic, it also aims to stabilize the number of casualties among train passengers and on the water.

The ambitions with respect to quality of life are aimed towards reducing noise nuisance, reducing emission of corrosive substances, a minor reduction in CO<sub>2</sub> emissions and the removal of physical hindrances by infrastructure.

### **1.3 The Development of the Cycling Policy**

Until the end of the nineteen-seventies cycling policy was directed mainly towards the road safety of the cyclist. In order to improve that separate cyclists' paths with specific safety provisions were installed at junctions. Cycling policy was subsequently expanded. Attention was first devoted to qualitatively high-grade cycle routes. Then came the realization that complete networks of cyclists' paths would raise the quality level of cycling facilities even further.

The SPT II policy was designed above all to improve the competitive position of the bicycle relative to that of the automobile. Not only was attention devoted to good infrastructural facilities and improvement of the facilities for participating in the traffic. The link between cycling and public transport was also the object of attention. The bicycle has in fact an important function in accessing public transport. Policy was also directed towards building more bicycle depots with better security against theft.

The cycling policy in the SPT II is further elaborated in the Dutch Bicycle Master Plan (DBMP). The main aim of the DBMP was to promote the use of the bicycle and at the same time to improve the safety and attractiveness of cycling. This objective was elaborated in a number of (quantitative) ideals with respect to the transition from the automobile to the bicycle (perhaps with public transport included), safety, theft prevention and communications. The project ran from 1990 to 1997 and provided a multiplicity of publications that provided the target groups with instruments to improve the position of cycling.

### **1.4 Cycling Policy in the NTT**

The NTT maintains in large measure the philosophy of SPT II intact for cycling policy. The emphasis is on the bicycle for shorter distances (to approximately 7.5 km). The project 'Short trips' is being employed to encourage the use of alternatives to the automobile for these distances. A trip by bicycle or on foot is in many instances a readier alternative than a trip by public transport. Also the subject



of special attention is the importance of the bicycle for access to public transport. For persons multimodality that according to the NTTP is going to play a key part the bicycle can have an important place.

The NTTP centralizes an important share of the responsibilities for traffic and transport. Under the predicate 'Management to measure' the NTTP will decentralize the financial resources to the regional public authorities. The basic principle is that cycling facilities will in large measure be financed from the decentralized resources. Decentralized government agencies will be deemed to adopt their own policies with respect to bicycle traffic. The attention that the NTTP devotes to bicycle traffic is consequently scant.

The plan does however identify the cycling policy as one of the essential elements. This means that decentralized government agencies in their future traffic and transport plans will have to take bicycle traffic into account.

## 2. A bird's Eye View of The Netherlands

Traffic and transport are closely related to the surface area of a country, its application of land, the size and structure of the population and the level of individual incomes

### 2.1 Area, Application of Land and Population Density

Agricultural applications of land have been in light decline since 1980. The natural environment is also continuing to decline. On the other hand woodland areas have increased since 1980. Built-up areas too continue to expand. Population density increased by more than 10% between 1980 and 1996.

**Table 2.1 The development of land application (in 1000 ha) and population density**

	<b>Agricultural application</b>	<b>Wood- land</b>	<b>Natural environment</b>	<b>Built-up area</b>	<b>Other</b>	<b>The Netherlands total (1)</b>	<b>Number of residents per km<sup>2</sup></b>
1980	2.419	295	158	272	250	3.395	415
1985	2.397	300	150	289	256	3.393	426
1989	2.399	310	141	297	840	3.986	436
1993	2.376	311	141	309	966	4.103	449
1996	2.351	323	138	320	1.021	4.153	457

Source: CBS

(1) Changes to total surface area of The Netherlands result mainly from the arrangement of inland and coastal waters

### 2.2 Size and Structure of the Population

The size and structure of the population exercises a major influence on mobility. The developments in this area are depicted in table 2.2.



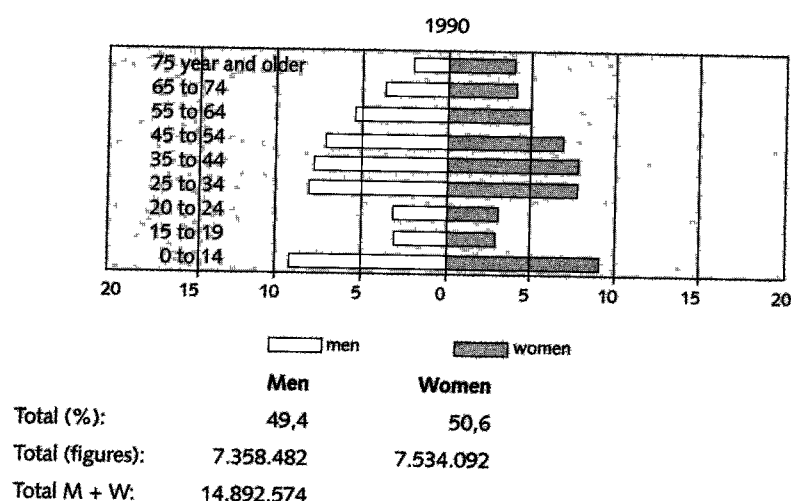
**Table 2.2 The development of population structure in terms of age (as % of total population)**

Age	1980	1985	1990	1995	1999
0 up to and incl. 19	31,6	28,1	25,6	24,4	24,4
20 up to and incl. 29	16,6	17,1	17,2	15,8	13,9
30 up to and incl. 59	36,3	38,0	39,8	42,0	43,7
59 a.o.	15,5	16,6	17,3	17,7	18,1
Total (%)	100	100	100	100	100
Total (figures)	14.091.014	14.453.833	14.892.574	15.424.122	15.760.225
(1980 = 100)	100	103	106	109	112

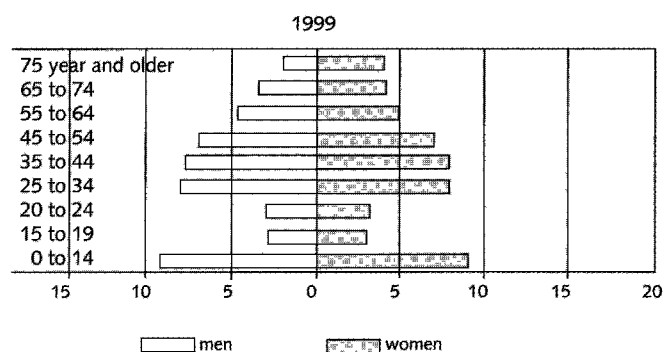
Source: CBS

The population of The Netherlands has increased from over 14 million persons in 1980 to almost 16 million in 1999. That is an increase of approximately 12%. Clear from both table 2.2 and the population pyramids is the increase of the number of older people (aging). The number of people over the age of 60 increased between 1980 and 1999 from 15.5% to 18.1%. The number of children of 19 years or younger declined between 1980 and 1995 from approximately 32% to some 24%. This percentage is now stabilizing. The population pyramids show that there are relatively many women in the 65-plus age range.

**Diagram 2.1 The development of population composition by age and gender (as % of total population)**



**Diagram 2.1 The development of population composition by age and gender (as % of total population) - continuation-**



	Men	Women
Total (%):	49,4	50,6
Total (figures):	7.793.271	7.966.954
Total M + W:	15.760.225	

Source: CBS

### 2.3 Individual Incomes

It can be seen from the table below that discretionary income has increased sharply since 1981. It was between 1990 and 1997 some 16%. This has had a significant effect on prosperity in The Netherlands. Increased prosperity can influence automobile ownership and mobility.

**Table 2.3 The development of the disposable income of individuals**

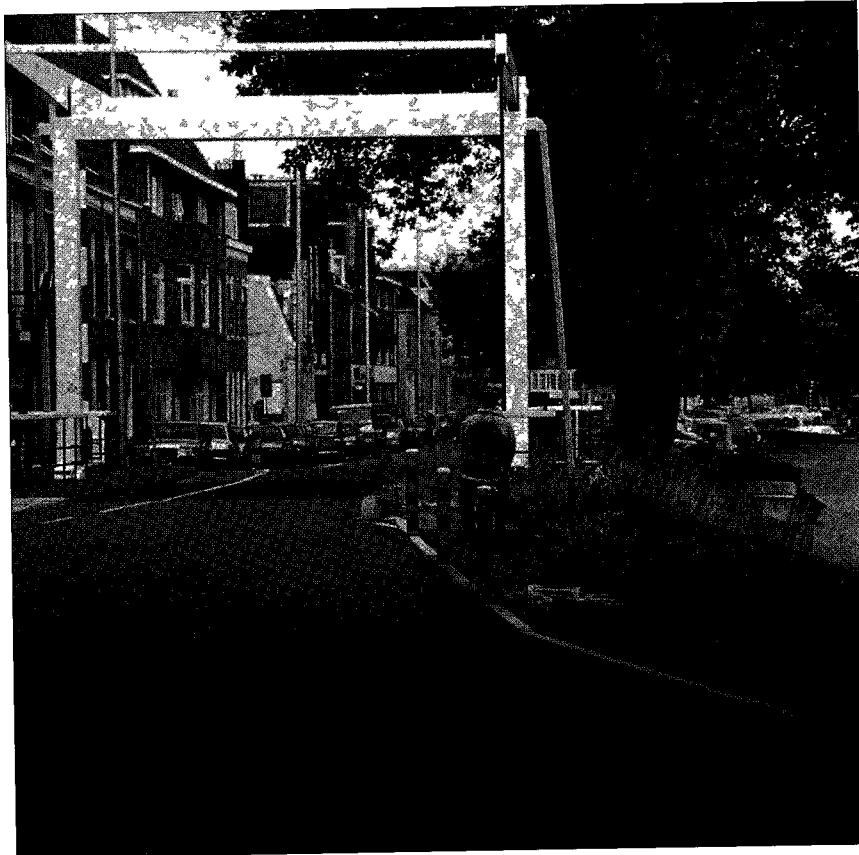
		Index (1981 = 100)
1981	f 28.400,-	100
1985	f 29.300,-	103
1990	f 33.800,-	119
1995	f 37.700,-	133
1997	f 39.300,-	138

Source: CBS

### 3. Bicycle Ownership and Cycling Facilities

A flat country like The Netherlands with its moderate climate is eminently suited to the bicycle as transport mode. Unsurprisingly an overwhelming majority of the Dutch population has always owned bicycles. This has resulted in an infrastructure for bicycles that is unsurpassed. Not even the increase growth in automobile ownership has made any difference to bicycle ownership. This chapter will address the key facts on

- the development of bicycle ownership relative to ownership of other types of transport and the availability of public transport,
- the development of the infrastructure for cyclists and other road users



### 3.1 Bicycle Ownership and Other Modes of Transport

Bicycle ownership grew steadily until the middle of the nineteen-nineties. Then the market seemed to become saturated: the number of bicycle owners now fluctuates at around 840 per 1000 residents. Automobile ownership too increased steadily between 1985 and 1999. 388 of every 1000 residents now own an automobile.

Table 3.1 shows this sharp growth in the number of bicycles between 1980 and 1990. The number of persons owning at least one bicycle increased by almost one-third. The number of mopeds fell sharply between 1980 and 1990. This explains in part the increase in bicycle ownership. Automobile ownership also increased sharply in the period 1980 to 1997, in fact by more than one-third. There are now in The Netherlands some 6 million automobiles.

**Tabel 3.1 The development of transport type ownership per 1000 residents**

	<b>Bicycle (1) (2)</b>	<b>Moped (2)</b>	<b>Automobile</b>	<b>Motorbike</b>
<b>1980</b>	<b>9.990</b>	<b>650</b>	<b>4.240</b>	<b>99</b>
<b>1985</b>	<b>11.035</b>	<b>520</b>	<b>4.551</b>	<b>121</b>
<b>1990</b>	<b>11.752</b>	<b>474</b>	<b>5.118</b>	<b>143</b>
<b>1995</b>	<b>12.670</b>	<b>529</b>	<b>5.581</b>	<b>294</b>
<b>1997</b>	<b>12.877</b>	<b>539</b>	<b>5.810</b>	<b>354</b>

*Source: CBS*

(1) For persons owning at least one bicycle

(2) The series for bicycle and moped are based on the old OVG (corrected series are unavailable)

### 3.2 Sale of Bicycles and Other Modes of Transport

The sale of bicycles fluctuated considerably between 1980 and 1990. Sales have now stabilized at around 1.3 million units per year. This ties in with the stabilization of bicycle ownership as also shown by table 3.1.

The sale of mopeds peaked in 1990. Then sales declined to nineteen-eighties' levels. Automobile sales reached in 1999 their highest level since 1980. An important contributor to this is the level of prosperity.

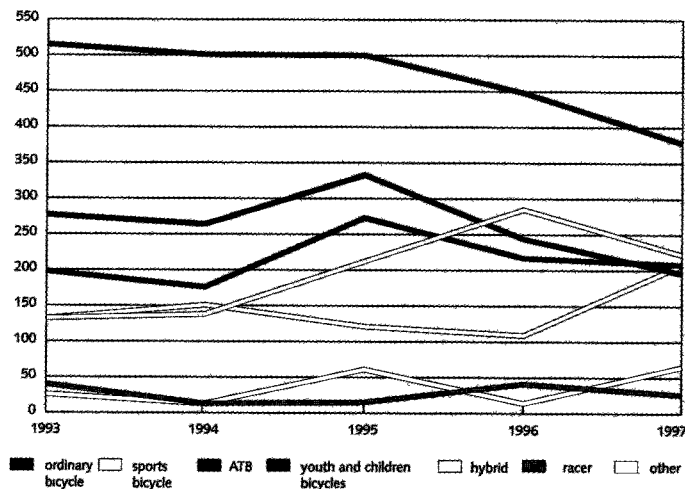
**Table 3.2 The development of sales of modes of transport (x 1000)**

	Bicycle	Moped	Automobile	Motorbike
1980	1.453	57	452	15
1985	964	49	496	8
1990	1.350	84	503	15
1995	1.350	59	446	18
1997	1.303	67	478	16
1999	.	.	612	18

Source: CBS

An examination of sales per type of bicycle shows a decline in the sales of ordinary bicycles. The market for ATBs is collapsing, after a sharp increase in 1995. Hybrids showed strong sales growth in 1997.

**Diagram 3.1 The development of sales of bicycles by type (x 1000)**



Source: Bovag-Rai, *Mobility in figures 1999 (Bicycles)*

### 3.3 Ownership of Transport Resources by Age and Gender

The table below shows that women are more likely to own a bicycle than men. Table 4.6 shows that men between 15 and 40 years of age cycle relatively little. That phenomenon does not apply to women. Men however are more likely to continue cycling to advanced age.

**Table 3.3 Ownership of transport resources by age and gender (in %)**

	<b>Bicycle</b>	<b>Moped</b>	<b>Automobile</b>	<b>Motorbike</b>	<b>None</b>
<b>Men</b>					
6 to 10 year	89,6				10,4
10 to 15	93,3				6,7
15 to 18	75,7	17,0			7,3
18 to 20	72,4	16,2	8,9	0,2	8,8
20 to 25	77,2	5,2	35,0	1,0	7,8
25 to 30	77,3	2,3	57,2	2,3	5,3
30 to 40	78,5	1,5	69,8	2,8	2,6
40 to 50	80,5	1,6	75,9	1,4	2,2
50 to 60	82,3	1,4	80,2	0,6	2,7
60 to 65	85,4	1,4	81,0	0,2	3,3
65 to 75	82,3	2,2	72,9	0,2	6,1
75 year or older	64,1	2,5	52,9	0,0	21,0
Total	80,5	2,8	55,6	1,1	5,3
<b>Women</b>					
6 to 10 year	89,1				10,9
10 to 15	92,9				7,1
15 to 18	81,7	10,4			7,8
18 to 20	79,2	10,7	4,0	0,0	9,3
20 to 25	82,4	5,2	23,9	0,4	8,3
25 to 30	84,5	2,1	42,0	0,6	7,5
30 to 40	88,3	1,9	52,3	0,6	4,5
40 to 50	86,4	2,6	48,8	0,3	5,6
50 to 60	86,9	1,9	42,0	0,1	6,9
60 to 65	83,7	1,5	28,7	0,1	11,2
65 to 75	73,5	1,9	22,2	0,0	19,9
75 year or older	37,9	0,9	11,6	0,0	56,5
Total	81,9	2,5	31,7	0,3	11,6

Source. CBS - OVG

There are significantly fewer women than men holding a driving license. Almost 86% of men hold a driving license as opposed to 68% of women. This difference is significantly greater for the higher age group categories. Best represented among license holders are men between the 30 and 65 years old (more than 90%).

**Table 3.4 Number of driving license holders (in %) by age and gender**

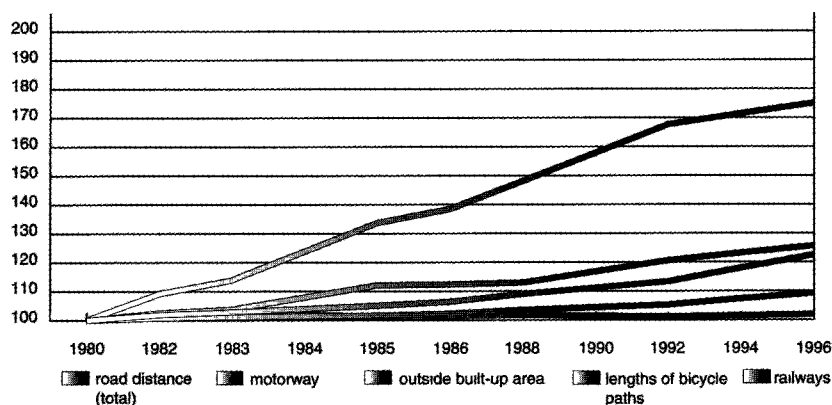
	Men	Women
18 to 25	59,2	55,7
25 to 30	86,0	79,8
30 to 40	92,5	86,6
40 to 50	93,4	82,2
50 to 60	93,7	75,9
60 to 65	91,3	61,6
65 to 75	83,0	43,1
75 year or older	61,3	17,6
Total	85,9	68,4

Source: CBS - OVG

### 3.4 Infrastructure: Roadways and Bicycle Depots

Diagram 3.2 depicts the length of surfaced roads, bicycle paths and railway tracks. It shows that between 1978 and 1996 cycle paths more than doubled in length. The increase in roads is significantly less, approximately 25%. This latter growth is explained to a significant extent by the expansion of motorways, particularly after 1998. The length of the railway systems' tracks has barely changed since 1978.

**Diagram 3.2 The development of the length of surfaced roads (by category), cycle paths and railway (1975 = 100)**



Source: CBS

Table 3.5 provides a more detailed picture of the bicycle path network, type of bicycle path, structure and trajectory. Two types of infrastructural cycling facilities may be distinguished:

- (free-running) bicycle paths, both inside and outside built-up areas;
- bicycle lanes, mainly on roads in built-up areas.

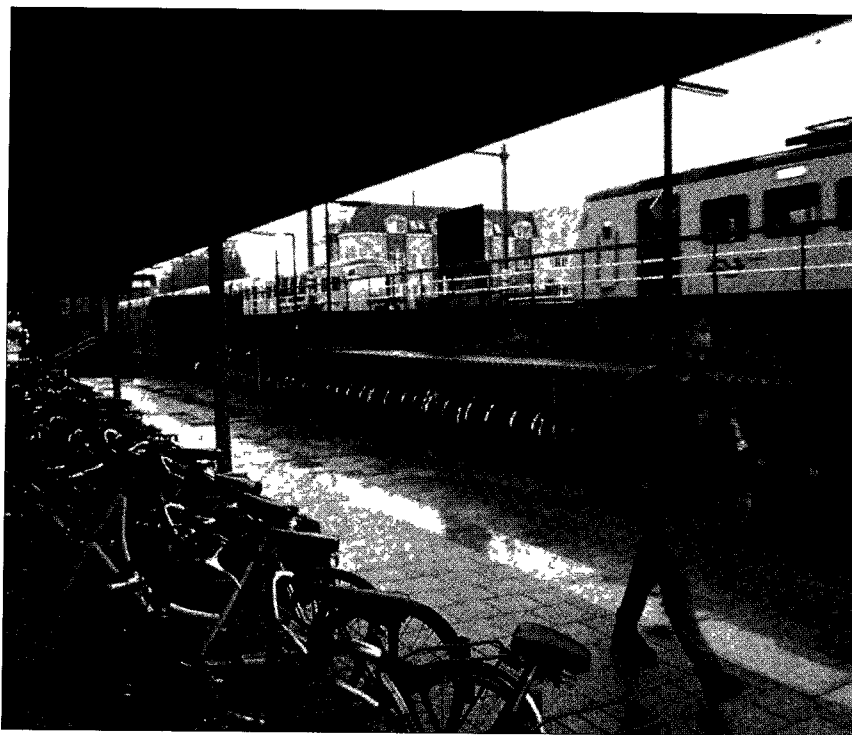
Bicycle paths with some 17,000 km are significantly more common than bicycle lanes (some 1,900 km). Bicycle paths are moreover generally laid alongside surfaced roads. More than 10,000 km of the bicycle paths are outside built-up areas, some 7,000 km within built-up areas. Between 1983 and 1996 the length of the bicycle lanes increased by a factor of 2.5. This means that the cycle lane network is growing faster than the bicycle path network (1.5 times the length of 1983).

**Table 3.5 The development of the length of cycle paths, cycle lanes and residential areas (in km)**

	1983	1988	1992	1996
<b>Cycle paths total</b>				
w.v.	11.521	14.889	16.605	17.075
Alongside surfaced road	7.747	9.915	11.139	11.689
Alongside unsurfaced road	1.193	1.220	1.312	1.068
Independent trajectory	2.581	3.755	4.154	4.317
<b>Cycle paths in built-up areas</b>				
w.v.	3.247	4.664	5.500	6.903
Alongside surfaced road	2.480	3.475	4.020	5.156
Alongside unsurfaced road	9	16	22	23
Independent trajectory	758	1.173	1.458	1.722
<b>Cycle paths outside built-up areas</b>				
w.v.	8.274	10.225	11.105	10.172
Alongside surfaced road	5.267	6.440	4.119	6.533
Alongside unsurfaced road	1.184	1.204	1.290	1.045
Independent trajectory	1.823	2.582	2.696	2.595
<b>Cycle lanes total</b>				
w.v.	822	1.171	1.570	1.909
Inside built-up areas	640	975	1.306	1.522
Outside built-up areas	182	196	264	387
<b>Residential areas</b>	.	1.510	2.140	1.976

Source: CBS (Road statistics 1996)





For the engagement of the bicycle as transport to and from public transport bicycle depots at stations and bus stops are important. Table 3.6 provides information on the development of the number of storage places at railway stations.

**Table 3.6 Development of number of storage places for bicycles at railway stations**

Type of bicycle depot	1985	1992	1999
Supervised	115.000	100.000	120.000
Unsupervised	65.000	90.000	143.000
Locked units	3.000	8.500	16.000
Total	183.000	198.500	279.000

*Source: Railinfrabeheer*

After a decline in the number of supervised depots in 1992, this number increased again in 1999. The number of unsupervised depots has increased sharply and is now more than doubled relative to 1985. The number of locked units has increased by a factor of more than five. No information is available on the number of storage and parking places at bus stops and other forms of public transport.

## 4. The Use of Bicycles

This chapter presents statistical data on the use of the bicycle in relation to other modes of transport. It employs in doing so two important indicators for the degree of use: the number of trips made by the average Dutch person and the distance he travels on each trip. The result of a particular analysis can to a significant extent be determined by the choice of one of these indicators. The most suitable of these two indicators may depend on the application intended. But in most instances objective analysis will require both indicators to be employed.

Paragraph 4.1 analyses bicycle use on the basis of the number of trips and paragraph 4.2 on the basis of distance travelled (both per person per day). Paragraph 4.3 provides information on the amount of time spent in traffic. Paragraph 4.4 addresses the use of the bicycle as access to and from public transport and paragraph 4.5 the use of the bicycle in relation to the degree of urbanization.

The following should be noted in connection with the data in this chapter:

- a. The CBS's Onderzoeksverplaatsingsgedrag (OVG) [Study of Travel Movements] now includes since 1995 children younger than twelve years old, what in previous years was not the case. A major alteration to measurement methodology in 1999 means that data on children under 12 years are not included in all tables.
- b. When several modes of transport are employed for a trip, that trip has been allocated to the mode of transport with which the greatest distance was travelled: the main mode of transport. (For example: by bicycle to the station, by train from town A to town B and by foot from the station to the final destination. The train is in this case the main mode of transport.)
- c. The figures in the time series for the year 1999 are definite; as a result of a recent change to measurement methodology preliminary figures have been included for the years prior to 1999.

### 4.1 Trips per Person per Day

Table 4.1 shows the development of the average number of trips per person per day, broken down by transport mode and purpose. Trips during holidays are not included. Each person makes more than three trips per day. Table 4.1 shows that, after an increase in 1989, the number of trips declined to 3.14 in 1998. In 1999 the number of trips was at approximately level as in 1998. The number of bicycle trips is approximately 0.8 per day and remains stable. The most important purposes are social-recreational and shopping, each representing a comfortable 0.2 trip per person per day. The number of bicycle trips with as purpose education declined between 1986 and 1999; from 0.11 to 0.08. Shopping and social-recreational showed a slight decline; trips to and from work during this period remained constant.

**Table 4.1 The development of the average number of bicycle trips per person per day by purpose (excl. children under 12 years)**

	To and from work	Business visit	Shopping	Education	Social- recreational	Other	Total bicycle	Total all modes of transport
1986	0,14	0,02	0,21	0,11	0,24	0,08	0,79	3,17
1989	0,16	0,02	0,23	0,10	0,25	0,09	0,85	3,33
1992	0,15	0,01	0,22	0,09	0,25	0,09	0,81	3,25
1995	0,15	0,01	0,21	0,08	0,25	0,11	0,81	3,20
1998	0,15	0,01	0,21	0,08	0,22	0,10	0,77	3,14
1999	0,16	0,01	0,21	0,08	0,22	0,10	0,79	3,15

Source: CBS - OVG

In the table below the number of trips per person per day have been elaborated for all modes of transport. The automobile scores the greatest number of trips, specifically some 1.5. Then there is the bicycle with 0.8, followed by walking with 0.6. For trips for educational purposes the bicycle remains the most important mode of transport. Walking is in half of the cases social-recreational.

**Table 4.2 The average number of trips per person per day in 1999 by main mode of transport and purpose (incl. children under 12 years)**

	To and from work	Business visit	Shopping	Education	Social- recreational	Other	Total
Bicycle	0,13	0,01	0,19	0,13	0,22	0,12	0,80
Moped	0,01	0,00	0,00	0,00	0,00	0,00	0,02
Walking	0,02	0,00	0,13	0,08	0,25	0,10	0,58
Automobile	0,30	0,09	0,31	0,05	0,50	0,29	1,54
Public transport	0,04	0,00	0,02	0,03	0,03	0,01	0,15
Other	0,01	0,00	0,00	0,01	0,03	0,01	0,05
<b>Total</b>	<b>0,53</b>	<b>0,12</b>	<b>0,66</b>	<b>0,30</b>	<b>1,03</b>	<b>0,53</b>	<b>3,15</b>

Source: CBS - OVG

The table below depicts the share of the bicycle for distance categories. Between 1986 and 1999, the bicycle is seen to retain a constant share of 25% of the total number of trips. The bicycle plays an important role for trips up to 5 km, its share declining thereafter. Between 1 and 2.5 km the bicycles' share is about 40%. The table shows that for distances up to 5 km the bicycle has been losing share since 1995.

**Table 4.3 The development of the share of the bicycle (in %) by number of trips by distance category (in km) in 1999 (excl. children under 12 years)**

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total bicycle	Total no. of tickets
1986	26,3	39,8	36,3	21,6	18,4	10,6	8,1	5,1	2,7	1,5	25,0	100
1989	27,5	40,8	37,0	21,1	17,1	11,0	7,8	4,8	3,8	1,7	25,4	100
1992	27,5	41,4	35,7	22,2	17,3	9,7	6,3	5,6	2,5	1,7	25,0	100
1995	26,8	40,6	37,3	22,6	19,1	10,4	7,2	4,7	3,2	1,4	25,3	100
1998	27,0	39,7	36,2	22,3	17,4	11,0	5,5	4,0	2,7	1,2	24,5	100
1999	25,5	42,4	34,7	22,7	17,7	11,7	6,7	2,8	0,0	0,4	24,9	100

Source: CBS - OVG (including mixed trips)

The choice for a particular mode of transport depends closely on the distance as is clear from table 4.4 and diagram 4.1. Walking is the dominant mode for distances to 1 km. For distances between 1 and 2.5 km the bicycle is much used. When distances are greater than 2.5 km the automobile is the most frequently used. Public transport is clearly at a relative advantage for longer distances. When specific distance categories are ignored the automobile is seen in general in 1999 to account for half of the number of trips. The bicycle is used for a quarter of all trips. Walking comes second as the most popular form of locomotion, good for about 18% of trips made.

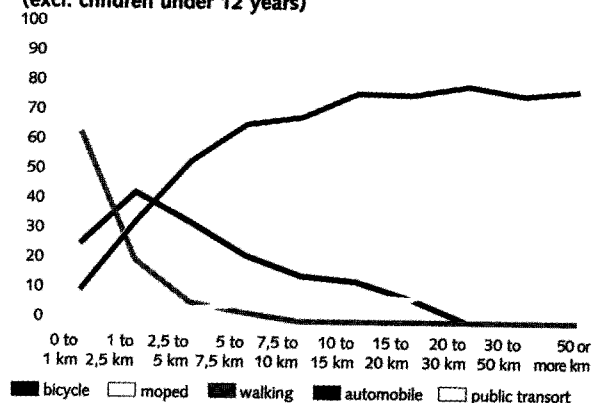
The importance of short trips by bicycle is addressed further in the publication 'Walking and cycling: good for municipal policy' (par. 2.4).

**Table 4.4** The share of the main modes of transport (in %) per distance category (in km) in 1999 (excl. children under 12 years)

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total
Bicycle	25,9	43,4	33,3	22,2	15,4	13,6	7,7	0,0	0,0	0,0	25,4
Moped	0,0	1,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,6
Walking	63,8	20,5	6,3	2,8	0,0	0,0	0,0	0,0	0,0	0,0	18,4
Automobile	10,3	33,7	54,2	66,7	69,2	77,3	76,9	80,0	76,9	78,6	48,6
Public transport	0,0	1,2	4,2	5,6	7,7	9,1	7,7	13,3	15,4	14,3	4,8
Other	0,0	1,2	2,1	2,8	0,0	4,5	0,0	0,0	0,0	0,0	1,6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Average. p.p.d.	0,58	0,83	0,48	0,36	0,13	0,22	0,13	0,15	0,13	0,14	3,15

Source: CBS - OVG (including mixed trips)

**Diagram 4.1** The share of the main modes of transport per distance category in 1999 (excl. children under 12 years)



Source: CBS - OVG

From table 4.5 can be seen that the number of trips per person per day has for men decreased between 1986 and 1999 from 3.35 to 3.16. Women are on the other hand making more trips per day; this number has increased from 3.00 to 3.15. It is fair to conclude that the trips per person per day are becoming the same for men and women. When it comes to trips by bicycle women have since 1986 been more mobile than men. The number of bicycle trips has been for women for years more

than 0.8, while for men it is 0.7. Both figures have remained reasonably constant since 1986. The greater mobility on the part of women is attributable to the age category 18 to 60 years. Men younger than 18 and older than 60 years make relatively more trips. People under 20 years of age moreover make many trips by bicycle. This number then declines rapidly, being replaced by the sharp increase of trips by automobile from this age.

**Table 4.5 The development of the average number of bicycle trips per person per day by gender and age**

	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total bicycle	Total no. of tickets
<b>1986</b>												
Men	2,08	1,66	1,27	0,74	0,61	0,57	0,47	0,47	0,59	0,64	0,74	3,35
Women	1,86	1,70	1,07	0,79	0,91	0,97	0,79	0,68	0,52	0,28	0,85	3,00
<b>1989</b>												
Men	2,05	1,76	1,27	0,87	0,69	0,64	0,56	0,56	0,57	0,56	0,78	3,49
Women	2,06	1,83	1,19	0,91	0,87	1,04	0,88	0,77	0,58	0,37	0,91	3,18
<b>1992</b>												
Men	2,07	1,77	1,08	0,85	0,73	0,63	0,53	0,51	0,58	0,51	0,74	3,38
Women	2,07	1,72	1,04	0,82	0,94	1,09	0,79	0,77	0,65	0,35	0,88	3,13
<b>1995</b>												
Men	1,85	1,69	1,16	0,76	0,63	0,63	0,61	0,54	0,61	0,53	0,73	3,26
Women	1,87	1,68	1,05	0,86	0,85	1,08	0,92	0,76	0,67	0,37	0,88	3,13
<b>1998</b>												
Men	1,78	1,66	0,98	0,73	0,59	0,57	0,62	0,54	0,58	0,51	0,69	3,17
Women	1,82	1,70	1,00	0,82	0,76	0,94	0,93	0,75	0,67	0,37	0,84	3,10
<b>1999</b>												
Men	1,74	1,60	0,99	0,70	0,59	0,56	0,63	0,57	0,73	0,58	0,71	3,16
Women	1,70	1,51	1,02	0,84	0,74	0,99	0,97	0,78	0,73	0,39	0,86	3,15

Source: CBS - OVG (including mixed trips)

Table 4.6 also presents the other modes of transport. This shows that for both men and women the bicycle is the most important mode of transport for the age range 12 to 20 years. For almost every other age category the bicycle is after the automobile the most important mode of transport.

**Tabel 4.6 The average number of trips per day by gender, main mode of transport and age in 1999**

	0 to 12	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total
<b>Men</b>												
Bicycle	0,91	1,74	1,60	0,99	0,70	0,59	0,56	0,63	0,57	0,73	0,58	0,71
Moped		0,01	0,20	0,15	0,05	0,02	0,02	0,02	0,02	0,01	0,02	0,03
Walking	0,85	0,53	0,31	0,30	0,29	0,41	0,45	0,42	0,45	0,67	0,60	0,45
Automobile	1,24	0,55	0,39	0,81	1,45	2,00	2,18	2,18	2,02	1,71	1,17	1,73
Public transport	0,03	0,14	0,27	0,51	0,42	0,19	0,14	0,12	0,11	0,07	0,07	0,16
Other	0,04	0,04	0,16	0,13	0,07	0,07	0,08	0,06	0,05	0,04	0,04	0,07
<b>Total</b>	<b>3,08</b>	<b>3,00</b>	<b>2,93</b>	<b>2,88</b>	<b>2,98</b>	<b>3,27</b>	<b>3,43</b>	<b>3,44</b>	<b>3,20</b>	<b>3,24</b>	<b>2,49</b>	<b>3,16</b>
<b>Women</b>												
Bicycle	0,90	1,70	1,51	1,02	0,84	0,74	0,99	0,97	0,78	0,73	0,39	0,86
Moped		0,00	0,10	0,06	0,03	0,01	0,02	0,02	0,02	0,01	0,01	0,02
Walking	0,93	0,47	0,38	0,36	0,48	0,67	0,79	0,60	0,58	0,61	0,56	0,61
Automobile	1,28	0,62	0,54	0,86	1,40	1,81	2,05	1,84	1,54	1,21	0,69	1,44
Public transport	0,03	0,15	0,36	0,64	0,43	0,27	0,13	0,13	0,11	0,11	0,11	0,19
Other	0,03	0,04	0,10	0,06	0,04	0,03	0,03	0,03	0,02	0,02	0,07	0,04
<b>Total</b>	<b>3,16</b>	<b>2,99</b>	<b>2,99</b>	<b>3,00</b>	<b>3,22</b>	<b>3,53</b>	<b>4,02</b>	<b>3,59</b>	<b>3,06</b>	<b>2,71</b>	<b>1,83</b>	<b>3,15</b>

Source: CBS - OVG (including mixed trips)

## 4.2 Distance Travelled per Person per Day (Transport Performance)

In addition to the number of trips as examined in the previous paragraph, it is also interesting to form an idea of how the distance travelled has developed. That is addressed in this paragraph.

The distance travelled per person per day by all modes of transport in fact increased sharply between 1986 and 1989. Since then the distance has remained reasonably stable. The distance travelled by bicycle has during this period been reasonably stable, being on average some 2.5 kilometre per day. The distance by bicycle is the most for social-recreational purposes: about 0.9 in 1999. This was somewhat lower in the first half of the nineteen-nineties.

For travel from home to work there has also been an increase of the distance travelled; in 1986 this distance was still 0.49 and by 1999 it had increased to 0.62.

This while the distance travelled by bicycle for educational purposes has actually decreased (from 0.56 to 0.37 km).

**Table 4.7 Table 4.7 The development of the distance travelled (in km) by bicycle per person per day by purpose (excl. children under 12 years)**

	To and from work	Business visit	Shopping	Educational	Social- recreational	Other	Total bicycle modes of transp.	Total all
1986	0,49	0,05	0,41	0,56	0,92	0,16	2,59	31,63
1989	0,57	0,06	0,42	0,46	1,07	0,18	2,76	34,25
1992	0,55	0,04	0,41	0,43	1,02	0,18	2,64	34,68
1995	0,57	0,04	0,42	0,37	1,01	0,23	2,65	34,16
1998	0,60	0,04	0,40	0,37	0,88	0,21	2,49	34,25
1999	0,62	0,05	0,40	0,37	0,91	0,19	2,54	34,86

Source: CBS - OVG (including mixed trips)

The table below includes not only the bicycle but also the other modes of transport. This shows that the automobile plays the most prominent role. Public transport too is quite sizable. This is in large measure due to the fact that this mode of transport covers longer distances, at higher speeds than the bicycle, moped or pedestrian. On average the greatest distances are travelled for social-recreational purposes (12.21). Then comes commuting (8.08).

**Table 4.8 Distance travelled (in km) per person per day by main mode of transport and purpose in 1999 (incl. children under 12 years)**

	From and to work	Business visit	Shopping	Education	Social- recreational	Other	Total
Bicycle	0,52	0,05	0,36	0,41	0,86	0,23	2,42
Moped	0,06	0,00	0,01	0,02	0,03	0,01	0,14
Walking	0,05	0,02	0,12	0,07	0,30	0,10	0,66
Automobile	5,98	2,71	2,26	0,52	9,55	3,36	24,38
Public transport	1,23	0,24	0,30	0,87	1,18	0,29	4,12
Other	0,24	0,10	0,02	0,08	0,30	0,08	0,81
<b>Total</b>	<b>8,08</b>	<b>3,12</b>	<b>3,08</b>	<b>1,96</b>	<b>12,21</b>	<b>4,07</b>	<b>32,53</b>

Source: CBS - OVG (including mixed trips)



Both tables below corroborate table 4.3 (The development of the share of the bicycle by number of trips by distance category) and table 4.4 (The share of main mode of transport by number of trips by distance category): the choice of mode of transport is closely dependent on the distance to be travelled. The total shares of the modes of transport with relatively high speeds (automobile and public transport) are greater than in tables 4.3 and 4.4.

**Table 4.9 The development of the share of the bicycle (in %) by distance travelled by distance category (in km) (excl. children under 12 years)**

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total bicycle	Total all modes of transport
1986	27,2	38,1	34,9	20,5	18,2	9,8	7,2	3,9	2,0	0,9	8,2	100
1989	28,4	38,9	35,1	20,0	16,7	9,9	6,6	3,4	3,3	1,0	8,1	100
1992	27,7	39,9	34,7	20,9	16,4	8,2	5,0	4,4	1,9	1,0	7,6	100
1995	26,2	38,6	36,0	21,5	18,5	9,0	6,1	3,7	2,5	0,8	7,7	100
1998	26,3	38,1	34,9	21,2	17,0	10,1	4,8	3,3	2,1	0,7	7,3	100
1999	24,1	40,5	32,8	21,9	17,2	11,1	6,2	2,6	1,4	0,3	7,3	100

Source: CBS - OVG

**Table 4.10 The development of the share of the mode of transport (in %) by distance travelled by distance category (in km) in 1999 (incl. children under 12 years)**

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total
Bicycle	25,8	41,5	32,4	21,0	16,4	10,6	6,0	2,5	1,5	0,3	7,5
Moped	0,0	0,8	1,2	1,4	0,9	1,1	0,5	0,3	0,0	0,0	0,4
Walking	64,5	20,0	5,9	1,9	0,9	0,4	0,5	0,0	0,0	0,1	2,0
Automobile	9,7	33,8	53,5	65,0	70,0	75,0	77,1	79,4	80,2	81,9	74,7
Public transport	0,0	2,3	5,9	8,4	10,0	11,4	13,3	14,7	15,5	14,8	12,8
Other	0,0	0,8	1,8	2,3	2,7	2,3	2,8	2,8	2,6	2,9	2,5
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Average p.p.p.d.	0,31	1,30	1,70	2,14	1,10	2,64	2,18	3,60	4,65	12,58	32,18

Source: CBS - OVG

The table below shows the development of the distance travelled for cyclists. In it a distinction is drawn between age and gender. When all modes of transport are examined men turn out to travel 1.5 kilometres more per day than women. For the distance travelled by bicycle this difference is smaller, being in fact 1.2 kilometre. The distance travelled by women fluctuated from 1986 to 1999 between 2.3 and 2.5. For men on the other hand there was a decline between 1989 and 1999. In 1989 the distance travelled was still 3.08 and by 1999 it had declined to 2.35. The greatest distances are travelled by people younger than 18 years. This then declines sharply being clearly influenced by the acquisition of a driving license.

**Tabel 4.11 The development of the distance travelled by bicycle (in km) per person per day by gender and age in 1999 (excl. children under 12 years)**

	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total bicycle	Total all modes of transport
<b>1986</b>												
Men	6,98	6,53	5,35	2,79	2,52	2,36	2,20	1,88	2,35	1,77	2,93	39,55
Women	5,89	5,71	4,10	2,23	2,11	1,89	1,92	1,64	1,71	0,85	2,26	23,89
<b>1989</b>												
Men	6,91	6,51	5,22	3,20	2,65	2,68	2,23	2,35	2,63	2,42	3,08	41,88
Women	6,10	5,97	4,28	2,61	2,14	2,17	2,14	2,21	1,85	1,17	2,45	26,81
<b>1992</b>												
Men	6,50	6,53	4,27	2,57	2,94	2,66	2,48	1,93	3,11	1,96	2,90	43,27
Women	6,89	5,93	3,27	2,31	2,26	2,34	1,93	2,36	1,80	1,03	2,39	26,28
<b>1995</b>												
Men	6,23	6,24	4,12	2,60	2,39	2,54	2,51	2,51	2,98	2,31	2,89	41,56
Women	6,20	5,64	3,12	2,38	2,19	2,34	2,21	2,31	2,16	1,18	2,41	26,92
<b>1998</b>												
Men	6,19	6,30	3,79	2,47	2,17	2,20	2,56	2,48	2,62	2,09	2,74	41,90
Women	5,89	5,85	2,97	2,28	2,02	1,98	2,23	2,15	1,92	1,09	2,26	26,79
<b>1999</b>												
Men	6,19	6,36	3,70	2,52	2,18	2,20	2,55	2,47	2,89	2,01	2,74	41,88
Women	5,96	5,45	3,61	2,54	2,01	2,22	2,37	2,07	2,12	1,09	2,35	28,02

Source: CBS - OVG

While we saw in table 4.5 (The development of the average number of trips per person per day by gender and age) that men did not make any more trips than women, we see in the table below that with these trips men cover nearly fifty per cent more kilometres. The difference in distance travelled per day begins at an age of approximately 20 years. What is clear is that men in the active age group (between 20 and 60 years) cover a greater distance per person per day than other age categories. This phenomenon does not apply to women. The table also shows that women between the ages of 15 and 60 years walk more than men. Cycling is typically an occupation for children to 18 years.

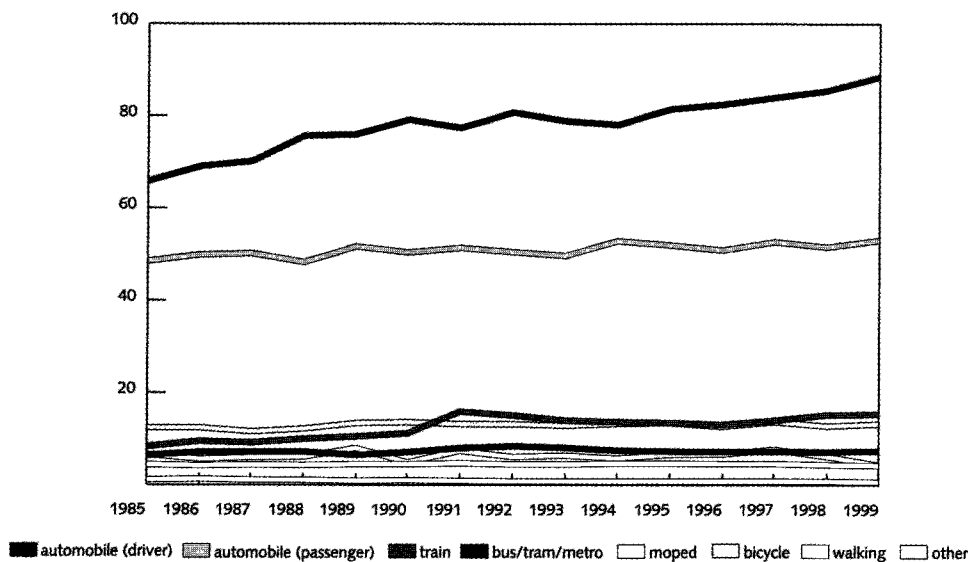
**Tabel 4.12 The average distance (in km) travelled per person per day by gender, mode of transport and age in 1999**

	0 to 12	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total
<b>Men</b>												
Bicycle	1,76	6,19	6,36	3,70	2,52	2,18	2,20	2,55	2,47	2,89	2,01	2,74
Moped		0,03	1,18	1,11	0,32	0,12	0,14	0,19	0,08	0,05	0,09	0,21
Walking	0,81	0,52	0,43	0,55	0,59	0,51	0,52	0,54	0,59	0,83	0,73	0,58
Automobile	13,64	9,95	7,50	17,07	27,29	40,07	42,28	40,30	39,43	26,65	15,86	32,16
Public transport	0,52	1,48	6,22	13,35	13,65	6,16	4,43	3,71	3,42	2,91	2,26	4,91
Other	0,44	0,71	1,58	1,32	1,33	1,82	1,63	1,42	1,21	0,66	0,44	1,27
<b>Total</b>	<b>17,17</b>	<b>19,88</b>	<b>23,28</b>	<b>37,10</b>	<b>45,69</b>	<b>50,86</b>	<b>51,20</b>	<b>48,72</b>	<b>47,20</b>	<b>33,98</b>	<b>21,38</b>	<b>38,02</b>
<b>Women</b>												
Bicycle	1,65	5,96	5,45	3,61	2,54	2,01	2,22	2,37	2,07	2,12	1,09	2,35
Moped		0,02	0,69	0,34	0,20	0,04	0,08	0,13	0,07	0,04	0,02	0,11
Walking	0,76	0,43	0,51	0,71	0,74	0,75	0,73	0,61	0,67	0,78	0,61	0,66
Automobile	13,96	9,92	8,54	13,73	20,17	26,41	25,25	23,79	23,21	19,22	9,22	19,76
Public transport	0,67	2,07	7,50	18,00	11,95	6,94	3,36	3,20	2,98	3,59	2,61	4,60
Other	0,24	0,63	1,28	0,98	0,59	0,41	0,44	0,44	0,53	0,26	0,63	0,54
<b>Total</b>	<b>17,29</b>	<b>19,03</b>	<b>23,96</b>	<b>37,38</b>	<b>36,18</b>	<b>36,57</b>	<b>32,07</b>	<b>30,54</b>	<b>29,52</b>	<b>26,00</b>	<b>14,19</b>	<b>26,44</b>

Source: CBS - OVG

Diagram 4.2 and table 4.13 depict the development of the number of traveller-kilometres that are made annually with the various modes of transport. The total transport effort amounted in 1999 to nearly 190 billion traveller-kilometres. That was in excess of 20% more than in 1985. The automobile was throughout the entire period far and away the most important mode of transport. The bicycle and the train compete for second place.

**Diagram 4.2 The development of the number of passenger-kilometres (x 1,000,000,000) per mode of transport (1)**



Source: CBS - OVG

- (1)
- a) The new approach by the OVG has broken the correlation in the examination results. The figures presented here are based on a preliminary correction.
  - b) Excluding mobility of residents of institutions.
  - c) For the development of transport performance from 1998 to 1999 the NS figures have been employed.



**Tabel 4.13 The development of the number of passenger-kilometres (x 1,000,000,000) per mode of transport**

	Automobile (driver)	Automobile (passenger)	Train	Bus/tram/ metro	Moped	Bicycle	Walking	Other	Total
1985	65,8	48,5	8,3	6,4	1,1	12,4	4,4	6,6	153,5
1986	69,1	49,9	9,5	7,1	1,3	12,4	4,2	5,6	159,1
1987	70,2	50,2	9,2	7,2	1,1	11,6	4,4	6,0	159,9
1988	75,7	48,3	10,0	7,2	1,1	12,2	4,3	6,1	164,9
1989	76,0	51,7	10,5	6,5	0,9	13,4	4,5	8,0	171,5
1990	79,2	50,4	11,2	7,1	1,0	13,6	4,5	4,9	171,9
1991	77,4	51,4	15,9	8,0	0,9	13,2	4,7	7,4	178,9
1992	80,8	50,5	15,1	8,4	0,8	13,2	4,5	6,1	179,4
1993	78,9	49,7	14,0	8,1	0,8	12,9	4,5	6,4	175,3
1994	78,1	52,9	13,7	7,5	0,8	13,3	4,7	5,8	176,8
1995	81,5	52,0	13,5	7,3	0,8	13,5	4,7	6,6	179,9
1996	82,5	50,9	13,1	7,2	0,8	12,7	4,6	6,7	178,5
1997	84,0	52,7	14,0	7,2	0,8	13,7	4,6	7,7	184,7
1998	85,5	51,6	15,2	7,2	0,8	12,8	4,4	6,2	183,7
1999	88,5	53,1	15,4	7,4	0,7	13,3	4,3	4,4	187,1

Source. CBS - OVG

The number of trips per person per day is enumerated in table 4.18 for four medium-sized cities. This shows the variation in choice of transport in the different cities. The table demonstrates that Utrecht and Zwolle are cities where there is very little cycling. Zwolle is far above the national average. There is relatively little cycling in Amsterdam but that is offset by a relatively higher than average number of trips by foot and extensive use of the well-developed public transport system. Breda is characterized by relatively heavy use of automobiles.

**Table 4.18 The number of trips (in %) per person per day by main mode of transport of the residents of four cities in 1999 (incl. children younger than 12 years of age)**

	<b>Amsterdam</b>	<b>Utrecht</b>	<b>Breda</b>	<b>Zwolle</b>	<b>The Netherlands total</b>
Bicycle	22,7	28,4	23,4	34,8	25,4
Moped	0,3	0,6	0,6	0,9	0,6
Walking	26,5	23,3	18,0	16,8	18,4
Automobile (driver)	20,0	24,6	34,2	28,0	31,7
Automobile (passenger)	12,4	11,7	18,7	14,6	16,8
Train	3,8	4,7	2,2	2,1	1,9
Bus/tram/metro	13,1	5,4	1,6	1,2	2,9
Other	1,0	1,3	1,3	1,2	1,6
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Figures	2,91	3,17	3,16	3,28	3,15

Source: CBS - OVG

## 5. The Undesirable Side Effects of Transport

The transport of persons and goods is characterized by side effects that are socially undesirable. The most important of these are road-safety hazards and environmental pollution. The road-safety hazards and environmental pollution caused by cycling are very slight. The other side of the equation however is the vulnerability of the cyclist, a vulnerability that may form an obstacle to cycling. The risk of the bicycle being stolen may also play a part here. This chapter will address these aspects of transport in more depth.

### 5.1 Road Safety

Traffic leads to accidents in which people are killed or injured. These accidents are registered on the basis of information provided by the police. Victims are in this registration system classified as dead, hospitalized or having been treated in the casualty department of the hospital. The level of registration declines with decline severity of the accident; the level of registration of death is approximately 95%, hospitalized approximately 60% and of casualties approximately 15%. In the middle of the nineteen-eighties the registration level of those hospitalized was still about 70% and in 1980 as high as 80%. As the registration becomes less complete its accuracy decreases too. Data on minor injuries is presented in full in this paragraph but is really not reliable enough to allow conclusions to be drawn. The data presented has been rounded up.

Paragraph 3.4 of the publication 'Cycling and walking: good for municipal policy' addresses further the benefits to road safety of more cycling.

#### Number of Victims

Of the 1066 road deaths 194 were cyclist. That is roughly 1 in 5. More than half of the road deaths was motorist. Table 5.1 shows a declining trend for the number of road deaths. The number of road deaths declined in 1998 by roughly 30% relative to 1986. The number of road deaths under cyclists fluctuates somewhat. After an increase in 1997 the number of deaths under cyclists declined in 1998 to below the level of 1996. The decline relative to 1986 amounted to roughly 38%. That means that this number is declining more sharply than the total number of deaths. The number of deaths among motorists and pedestrians was between 1996 and 1998 reasonably stable.

**Table 5.1 The development of the number of deaths by mode of transport**

	<b>1986</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Automobile	741	575	547	551
Motorbike/scooter	64	91	92	76
Moped	134	107	88	89
Bicycle	312	233	242	194
Pedestrian	216	109	119	110
Other mode of transport	62	65	75	46
<b>Total</b>	<b>1529</b>	<b>1180</b>	<b>1163</b>	<b>1066</b>

*Source: Transport Research Centre - BG*

In contrast to the decline in the number of deaths there has been no reduction in the numbers hospitalized. The total number of those hospitalized fluctuated from 1990 to 1998 at around the 20,000. It is however certainly true that the number hospitalized was in 1998 at its lowest level since 1990. The same trend applied to the number of cyclists hospitalized. Cyclists form the majority of those hospitalized. More than one-third of those hospitalized in 1998 were cyclists. Another third of those hospitalized were in 1998 motorists.

**Table 5.2 The development of the number of hospitalized by mode of transport**

	<b>1990</b>	<b>1992</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Automobile/delivery van	7.030	6.390	6.540	6.410	6.230	6.420	6.120
Truck/bus	110	100	130	130	130	130	90
Motorbike	1.200	1.280	1.340	1.330	1.360	1.380	1.110
Moped	3.680	3.070	2.990	3.140	3.000	3.180	3.110
Bicycle	6.780	6.770	7.040	7.290	7.000	7.450	6.760
Pedestrian	1.830	1.720	1.700	1.590	1.600	1.530	1.340
Other mode of transport	110	110	110	110	110	110	90
<b>Total</b>	<b>20.750</b>	<b>19.430</b>	<b>19.840</b>	<b>20.000</b>	<b>19.420</b>	<b>20.190</b>	<b>18.620</b>

*Source: Transport Research Centre - BG*

The number of casualty department cases like the number hospitalized can be said to be stable. It has since 1994 fluctuated at around the 100,000. It should be noted however that the level of registration of such cases is extremely low. And only



general conclusions may be derived from it. About half of the casualty department cases are cyclists. The number of motorists and moped users is also high.

**Table 5.3 The development of the number of casualty department cases by mode of transport**

	1994	1995	1996	1997	1998
Automobile/delivery van	20.500	20.100	20.700	20.200	22.700
Truck/bus	500	400	400	700	1.200
Motorbike	4.600	4.100	4.500	4.900	4.900
Moped	15.100	13.700	13.300	17.100	17.900
Bicycle	51.800	59.600	47.000	58.300	53.400
Pedestrian	5.200	3.700	4.100	4.200	3.700
Other mode of transport	1.300	400	1.000	2.600	1.200
<b>Total</b>	<b>99.000</b>	<b>102.000</b>	<b>91.000</b>	<b>108.000</b>	<b>105.000</b>

Source: Transport Research Centre- BG

The table below analyzes numbers of dead by mode of transport and age. More than one-third (71) of road deaths are of persons above the age of 65 years. Children up to 17 years also form a risk group; more than a quarter (51) of deaths under cyclists are from this group. Also among pedestrians there are many deaths in the age group 65 years or older: 52 of the 111 dead are 65 years or older. For drivers and passengers of automobiles it is precisely the opposite. Almost half of the deaths are in the age group 18 to 34 years.

**Table 5.4 Number of deaths by age and mode of transport in 1999**

Age	Automobile driver/ passenger	Bicycle	Moped	Pedestrian	Others	Total
0 up to and incl. 17 years	36	51	30	18	1	136
18 up to and incl. 34 years	251	13	26	16	81	387
35 up to and incl. 64 years	157	59	25	25	59	325
65 years and over	90	71	26	52	3	242
<b>Total</b>	<b>534</b>	<b>194</b>	<b>107</b>	<b>111</b>	<b>144</b>	<b>1.090</b>

Source Transport Research Centre - BG

#### Accidental deaths by other party

The table below analyzes the number of accidental deaths under cyclists for the years 1990 to 1998 by the other party involved in each accident. The number of deaths for one-party accidents (accidents in which no second party is involved) is significantly in the minority. More than 40% of the deaths of cyclists involve an accident with an automobile. About 20% of the deaths are the result of an accident involving a truck or delivery van. The table shows clearly the declining trend in the total number of deaths. For those accidents involving parties a declining trend can be detected.

**Table 5.5 The development of the number of deaths of cyclists in road accidents by other party involved**

No other party involved		Accident involving two parties			Accident involving more than two parties		Total
		Automobile	Truck/ delivery van	Motorb./ scooter	Other modes of transport		
1990	9	137	83	4	32	39	304
1991	4	120	53	5	30	26	238
1992	5	124	66	4	23	29	251
1993	12	124	48	4	27	29	244
1994	11	108	81	4	31	34	269
1995	13	119	73	5	28	29	267
1996	8	104	77	4	22	18	233
1997	10	118	50	4	30	30	242
1998	13	82	44	3	21	31	194

Source: Transport Research Centre - BG

Table 5.6 does not restrict itself to accidents in which bicycles are involved. Other modes of transport have also been included. A distinction is made for the severity of the injury. This table shows that more than 40% of the victims were involved in an accident with a bicycle/moped. More than a quarter of the victims are involved in accidents between bicycles/mopeds and motorized traffic. This proves that motorized traffic is a major hazard to bicycle/moped traffic. The numbers of victims of accidents involving bicycles/mopeds and heavy motorized traffic is relatively limited, but does cause relatively more deaths.

**Table 5.6 The number of victims (in %) in 1999 by other party and severity of injury in 1999**

	Dead	Injured, hospitalized	Injured, other	Total
<b>Bicycle/moped versus ...</b>	28,0	37,0	45,1	42,8
Motor vehicle	17,7	24,3	29,1	27,7
Heavy motor vehicle	5,7	1,6	1,0	1,2
Bicycle/moped	2,3	6,4	9,5	8,6
Pedestrian	0,8	1,7	2,1	2,0
No other vehicle	1,5	3,0	3,4	3,3
<b>Pedestrian versus ...</b>	8,7	5,5	3,4	4,0
Motor vehicle	7,0	5,2	3,2	3,8
Heavy motor vehicle	1,7	0,3	0,2	0,2
<b>Motor vehicle versus ...</b>	60,8	53,3	48,1	49,7
Motor vehicle	21,2	28,7	33,6	32,2
Heavy motor vehicle	8,5	4,1	3,3	3,6
No other vehicle	3,7	4,8	2,8	3,3
Other	27,4	15,7	8,4	10,6
<b>Heavy motor vehicle versus ...</b>	0,7	0,5	0,5	0,5
Heavy motor vehicle	0,6	0,4	0,4	0,4
No other vehicle	0,1	0,1	0,1	0,1
<b>Other</b>	1,8	3,6	2,9	3,1
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Transport Research Centre - BG

## 5.2 Emission of Air Pollutants

The use of motorized vehicles has a variety of negative effects on the environment. This paragraph addressed the emission of air pollutants by road traffic. For the purposes of comparison emissions have been included for other mobile sources. Bicycle and pedestrian traffic are obviously free of such emissions. This paragraph will deal with the emission of the following substances:

- CO (carbon monoxide);
- CO<sub>2</sub> (carbon dioxide);
- NO<sub>x</sub> (nitrogen oxides);
- SO<sub>2</sub> (sulphur dioxide);
- Volatile organic substances (VOS).

NOx and SO2 induce acidification and CO2 is responsible for the greenhouse effect. CO is detrimental to health and volatile organic substances cause smog, particularly during the summer.

Motorized road traffic is responsible for the lion's share of emissions. The share of road traffic in the total emission of mobile sources varies for each substance from 64% (NOx) to 90% (CO). Only for SO2 is the share more modest: only 20%. The share of rail traffic in the emission of the various substances is very limited.

The emission of most air pollutants declined between 1993 and 1998. CO2, SO2 and VOC emissions were in fact reduced by about one-quarter. NOx fell by about 17%. Carbon dioxide emissions however increased by about 15%.

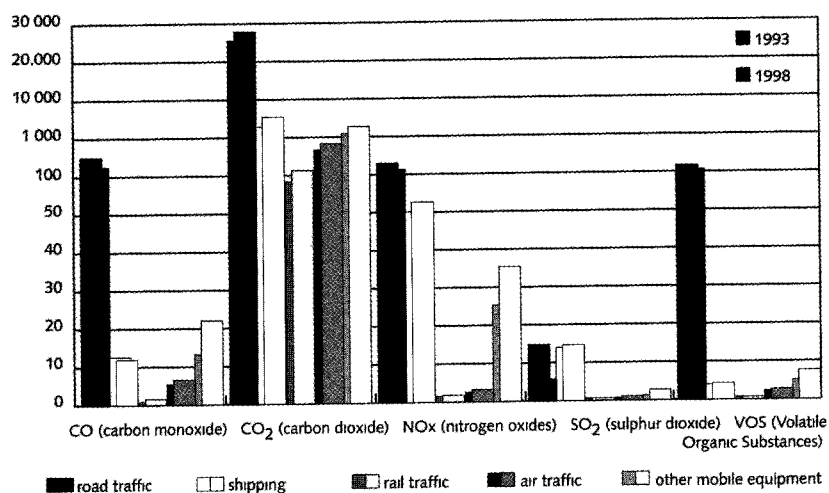
The major role that road traffic plays in these emissions indicates the importance of bicycle traffic. An increase in travel by bicycle can reduce road traffic emissions even more. Paragraph 3.7 of the publication 'Walking and cycling: good for municipal policy' addresses in more detail the significance of bicycle traffic for reduction of the emissions of air pollutants.

**Table 5.7 The emission of air pollutants by mobile sources (in million kg) in 1998**

	CO (carbon monoxide)	CO <sub>2</sub> (carbon dioxide)	NOx (nitrogen oxides)	SO <sub>2</sub> (sulphur dioxide)	VOS (Volatile Organic Substances)
Road traffic	398	28.338	180	4,7	111
River/canal shipping	2,2	2.022	38	2,2	2,1
Seagoing shipping	2,8	1.119	22	13	1,0
Recreational sailing	7,1	108	1,3	0,1	1,6
Rail traffic	0,4	102	1,7	0,1	0,1
Air traffic	6,0	773	3,0	0,3	1,2
Agricultural machinery	14	1.463	23	1,6	4,7
Other mobile tools	7,7	806	13	0,9	2,6
<b>Total</b>	<b>438</b>	<b>34.732</b>	<b>283</b>	<b>23</b>	<b>125</b>

Source: CBS

**Diagram 5.1 The emission of air pollutants by mobile sources (in million kg)**



Bron: CBS

### 5.3 Bicycle Theft

A major obstacle to using bicycles and their promotion is the high risk of theft. A common source of information on bicycle theft is the police record. This record however simply shows the top of the iceberg. Reporting the theft of a bicycle seldom results in its recovery and many victims see no benefit in it. For this reason this paragraph provides not only information from the police records but also results from population questionnaires.

The number of bicycle thefts known to the police in 1998 was 144,000. That was a substantial reduction compared to 1990. It is not known to what extent this was caused by reluctance to report such thefts. There was however a sharp increase between 1980 and 1990. Theft of mopeds has since 1980 fluctuated at around the 20,000. The number of automobiles stolen rose sharply between 1980 and 1998 (from 14,500 to 37,400). This correlates to a major extent with increased automobile ownership (see par. 3.1).

**Table 5.8 The development of the number of recorded thefts of vehicles (x 1,000)**

	1980	1990	1998
Bicycle theft	117,6	194,2	143,5
Moped theft	20,2	18,9	20,1
Motorbike/scooter theft	1,5	1,8	2,7
Automobile theft	14,5	27,3	37,4
Theft of motor vehicles	1,2	1,8	5,6
<b>Total</b>	<b>155,0</b>	<b>244,0</b>	<b>209,3</b>

*Source: CBS (subject to police and gendarmerie reports)*

CBS inquiries show that some 6% of the population of 15 years and older has been the victim of bicycle theft. That was a slight increase relative to 1997. Due to a trend interruption it is impossible to tell whether this is an increase relative to previous years. The number of people reporting automobile theft remains reasonably constant.

**Table 5.9 The development of the section of the population (15 years and older) that was victim of theft of a vehicle (in %)**

	1980	1988	1996	1997	1998
Bicycle theft	4,9	5,7	5,1	6,0	6,2
Moped theft	0,4	0,3	(1)	(1)	(1)
Automobile theft	0,3	0,3	0,2	0,2	0,2

*Source: CBS (living conditions inquiry)*

(1) Unknown (not recorded in Statistics Yearbook)

(2) Start of a new series as a result of alteration to inquiry structure

As can be seen from table 5.9 based on population studies the number of victims of bicycle theft in 1998 was roughly 30 times as large as the number of automobile thefts. Table 5.8, based on police records, the same comparison provides a factor of 4. It is safe to assume that an automobile theft will always be reported to the police. The difference between these two factors shows that a significant number of bicycle thefts is not reported to the police.

## **Appendix I. Facts on Walking in The Netherlands**

### **1. Introduction**

This appendix on the publication 'Facts on cycling in The Netherlands' is directed specifically towards pedestrians. The main reason for including facts on walking in a separate document was the manner in which the OVG [Study of Travel Movements] was conceived. Until recently the OVG was largely oriented towards main mode of transport. Pre- and post-transport was however, to the extent known, included in the distances travelled per mode of transport. This was however little known because the respondent often made no reference to it in the questionnaire.

Since 1999 pre- and post-transport to and from the public transport system has been much more closely followed by means of later questionnaires. This has resulted in reasonably reliable figures for cycling. The figures for walking have also been improved, but they are certainly not yet complete, since even for travel by automobile in many instances pre- and post-transport is required and is mainly by foot.

The united road safety organizations (3VO) have made calculations on the OVG in order to compensate for this deficiency. There is no agreement among statisticians as to these figures, but they do provide an interesting insight into the level of the figures that the pedestrians might provide.

It is for this reason that figures are presented in this document from both the OVG (paragraph 2) and from 3VO (paragraph 3). Figures specifically addressed to the road safety of pedestrians follow in paragraph 4.

### **2. Walking: Figures OVG**

#### **2.1 Number of Trips**

Every person makes more than 3 trips per day utilizing the various modes of transport. About one-sixth of these trips are made by foot. Of trips by foot some half is devoted to recreational purposes (strolling). Shopping is also an important purpose. Since 1989 the number of trips by all modes of transport has declined. This applies also to trips by foot. Particularly in the second half of the nineteen-nineties the number of trips by foot declined sharply. This decline is due in important measure to a reduction in the number of trips for shopping and for social-recreational purposes.

**Tabel I.1 The development of the average number of trips by foot as main mode of travel per person per day by purpose (excl. children under 12 years of age)**

	To and from work	Business visit	Shopping	Education	Social- recreational	Other	Total by foot	Total all modes of transport
1986	0,04	0,01	0,16	0,02	0,28	0,08	0,59	3,17
1989	0,04	0,01	0,17	0,02	0,30	0,07	0,62	3,33
1992	0,04	0,00	0,16	0,01	0,29	0,08	0,59	3,25
1995	0,03	0,00	0,16	0,01	0,29	0,09	0,59	3,20
1998	0,03	0,00	0,15	0,01	0,27	0,09	0,55	3,14
1999	0,03	0,00	0,15	0,01	0,25	0,08	0,53	3,15

Source: CBS - OVG

Table I.2 shows that about 17% of all trips are made by foot. For distances up to 1 kilometre that figure is as high as 65%. For distances like this walking is by far the most prevalent mode of travel. This share declines rapidly for longer distances. Between 1986 and 1992 walking retained a constant share. Walking's share declined thereafter from 18.6% to 16.8% in 1999. This share declined for almost all distances. Except for distances up to 1 kilometre; the share of walking here increased from 62.5% in 1998 to 64.7% in 1999.

**Table I.2 The development of the pedestrians' share (in %) as main mode of transport by number of trips by distance category (in km) (excl. children under 12 years of age)**

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total by foot	Total all modes of transport
1986	63,7%	27,4%	9,4%	4,9%	1,7%	1,2%	0,2%	0,2%	0,0%	0,0%	18,7%	100
1989	63,7%	26,0%	9,8%	5,4%	2,7%	1,3%	0,2%	0,0%	0,1%	0,0%	18,6%	100
1992	64,1%	27,0%	10,3%	5,3%	2,7%	1,3%	0,3%	0,2%	0,0%	0,0%	18,6%	100
1995	63,2%	26,1%	9,3%	5,3%	2,0%	1,3%	0,4%	0,2%	0,0%	0,0%	18,3%	100
1998	62,5%	25,4%	8,5%	5,1%	1,9%	1,3%	0,4%	0,2%	0,1%	0,0%	17,7%	100
1999	64,7%	20,5%	6,1%	1,6%	0,6%	0,3%	0,1%	0,0%	0,0%	0,0%	16,8%	100

Source: SBS - OVG



In table I.3 the number of trips by foot are analyzed by gender and age. It can be seen that in 1999 men made approximately as many trips as women. Women make significantly more trips by foot than men and the cause of this difference is the number of trips by foot made by the age group from 15 to 60 years of age; this group makes more trips than men. The age group from 15 to 25 years of age makes relatively few trips by foot. Developments since 1986 have shown a decline in the number of trips made by men while the number made by women has actually increased. Trips by foot have declined for both women and men.

**Table I.3 The development of the average number of trips by foot per person per day by gender and age**

	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total by foot	Total all modes of transport
<b>1986</b>												
m	0,51	0,56	0,54	0,42	0,58	0,49	0,39	0,44	0,51	0,66	0,50	3,35
w	0,66	0,54	0,55	0,67	1,00	0,79	0,54	0,59	0,77	0,60	0,68	3,00
<b>1989</b>												
m	0,68	0,49	0,42	0,45	0,70	0,55	0,41	0,43	0,71	0,65	0,54	3,49
w	0,76	0,56	0,52	0,66	0,88	0,81	0,59	0,62	0,65	0,71	0,70	3,18
<b>1992</b>												
m	0,59	0,46	0,36	0,35	0,54	0,57	0,43	0,50	0,62	0,68	0,52	3,38
w	0,52	0,57	0,54	0,60	0,94	0,85	0,56	0,65	0,64	0,56	0,67	3,13
<b>1995</b>												
m	0,49	0,40	0,40	0,42	0,55	0,54	0,46	0,46	0,58	0,58	0,50	3,26
w	0,59	0,48	0,44	0,59	0,85	0,91	0,59	0,61	0,70	0,54	0,67	3,13
<b>1998</b>												
m	0,57	0,38	0,37	0,42	0,49	0,47	0,45	0,45	0,54	0,56	0,48	3,17
w	0,56	0,43	0,45	0,52	0,74	0,82	0,62	0,58	0,70	0,53	0,63	3,10
<b>1999</b>												
m	0,53	0,31	0,30	0,29	0,41	0,45	0,42	0,45	0,67	0,60	0,45	3,16
w	0,47	0,38	0,36	0,48	0,67	0,79	0,60	0,58	0,61	0,56	0,61	3,15

Source: CBS - OVG

## 2.2 Distance Travelled

Each person travels approximately 35 kilometre per day of which on average 600 metre by foot. Just as is the case for the number of trips table I.4 demonstrates that the most important purpose is social-recreational. After that a relatively major share of the distance travelled per day is devoted to shopping.

The distance travelled by all modes of transport remained, after a strong increase between 1986 and 1989, constant between 1989 and 1999. The distance travelled by foot has however declined since 1989. This decline was due specifically to a decline in shopping and social-recreational purposes.

**Table I.4 The development of the distance travelled (in km) by foot per person per day by purpose (excl. children under 12 years of age)**

	To and from work	Business visit	Shopping	Education	Social- recreational	Other by foot	Total all modes of transp.	Total all
1986	0,04	0,01	0,16	0,02	0,28	0,08	0,59	3,17
1986	0,05	0,01	0,16	0,03	0,38	0,07	0,71	3,16
1989	0,06	0,01	0,16	0,03	0,43	0,07	0,75	3,43
1992	0,05	0,01	0,15	0,03	0,41	0,08	0,73	3,47
1995	0,06	0,01	0,16	0,04	0,40	0,09	0,74	3,42
1998	0,06	0,01	0,14	0,03	0,37	0,08	0,69	3,43
1999	0,06	0,01	0,13	0,03	0,32	0,06	0,62	3,49

Source: CBS - OVG

Table 1.5 shows the development of the distance travelled by distance category. Less than 2% of the distance travelled is covered by foot. This table demonstrates for the rest the same as the table for the number of trips: walking is dominant for distances up to 1 km and then rapidly loses significance.

**Tabel 1.5 The development of the share of the pedestrian (in %) by distance travelled by distance category (in km)**

	0 to 1	1 to 2,5	2,5 to 5	5 to 7,5	7,5 to 10	10 to 15	15 to 20	20 to 30	30 to 50	50 or more	Total by foot	Total all modes of transport
1986	60,8%	24,3%	8,1%	3,7%	1,6%	0,9%	0,1%	0,3%	0,0%	0,0%	2,2%	100,0%
1989	61,2%	23,6%	7,4%	4,7%	1,8%	0,9%	0,2%	0,2%	0,0%	0,0%	2,2%	100,0%
1992	62,2%	24,7%	8,0%	3,6%	2,1%	0,8%	0,2%	0,1%	0,0%	0,0%	2,1%	100,0%
1995	62,5%	25,0%	7,7%	3,8%	1,7%	0,9%	0,3%	0,1%	0,1%	0,0%	2,2%	100,0%
1998	61,9%	24,3%	7,0%	3,6%	1,5%	0,8%	0,3%	0,1%	0,0%	0,0%	2,0%	100,0%
1999	62,1%	20,7%	5,7%	1,7%	0,7%	0,4%	0,1%	0,1%	0,0%	0,0%	1,8%	100,0%

From table I.6 can be seen that men on average travel a greater distance per day than women (42 km versus 28 km). The distance travelled by foot however provides a different picture: women travel on average more (kilo)metres by foot per day than men (660 m versus 580 m). This too is due primarily to the age group between 15 and 60 years of age. It is in fact the case that both men and women between 60 and 65 years of age cover many (kilo)metres by foot. The total number of kilometres travelled by women increased from 24 km in 1986 to 28 km in 1999. On the other hand kilometres travelled by foot by women declined between 1989 and 1999 from 0.78 to 0.66. The distance travelled by men also declined in this period (from 0.73 to 0.58). This decline for both men and women applies to all ages.

**Table 1.6 The development of the distance travelled by foot (in km) per person per day by gender, mode of transport and age in 1999 (excl. children under 12 years of age)**

	12 to 15	15 to 18	18 to 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 65	older than 65	Total by foot	Total all modes of transport
<b>1986</b>												
m	0,51	0,62	0,75	0,57	0,84	0,63	0,56	0,63	0,78	1,01	0,68	39,55
w	0,68	0,55	0,66	0,74	1,01	0,77	0,57	0,68	0,88	0,69	0,73	23,89
<b>1989</b>												
m	0,62	0,46	0,52	0,67	0,87	0,73	0,60	0,71	1,01	0,99	0,73	41,88
w	0,60	0,63	0,69	0,77	0,97	0,83	0,66	0,81	0,75	0,79	0,78	26,81
<b>1992</b>												
m	0,48	0,55	0,66	0,49	0,66	0,85	0,59	0,80	0,93	0,98	0,72	43,27
w	0,42	0,61	0,61	0,69	0,89	0,86	0,65	0,75	0,79	0,69	0,73	26,28
<b>1995</b>												
m	0,53	0,60	0,80	0,71	0,71	0,67	0,64	0,74	0,93	0,82	0,71	41,56
w	0,60	0,57	0,82	0,80	0,95	0,88	0,66	0,76	0,97	0,69	0,78	26,92
<b>1998</b>												
m	0,51	0,42	0,65	0,70	0,69	0,59	0,61	0,65	0,81	0,84	0,66	41,90
w	0,52	0,53	0,72	0,76	0,83	0,77	0,67	0,75	0,86	0,65	0,72	26,79
<b>1999</b>												
m	0,52	0,43	0,55	0,59	0,51	0,52	0,54	0,59	0,83	0,73	0,58	41,88
w	0,43	0,51	0,71	0,74	0,75	0,73	0,61	0,67	0,78	0,61	0,66	28,02

Source: CBS - OVG

### 3. Walking: Figures 3VO

Walking is supremely suited for travel to and from a variety of modes of transport. The former Pedestrians' Association (now part of 3VO) has on the basis of the OVG 1997, study by Nederlandse Spoorwegen (NS) and the Logbook Project of the Pedestrians' Association, compiled the tables below, including travel to and from. The references are no longer to trips (from A to B with the possible involvement of several modes of transport) but to stages. By a stage we mean a portion of a trip that is made by a particular mode of transport. Both tables show that not only walking, but also cycling has a significantly greater share in the number of stages rather than in the number of trips.

From the OVG figures (see previous paragraph) it appears that the number of trips for which the main mode of travel is walking is about 17% per person per day. Table I.7 shows that this share is almost 60% when travel to and from other modes of transport are included. Walking is in this way far and away the most important mode of travel for stages. At some distance the automobile (driver plus passenger more than 23%) and the bicycle (about 15%) follow. Stages by foot are at their most prevalent for shopping (13%, followed by visiting (9%) and home to work (9%).

**Table I.7 The number of stages by purpose and mode of transport**

Purpose	By foot	Bicycle	Autom. driver	Autom. pass.	Train	Bus/ tram/ metro	Moped	Other	Total
Home- work	9,1	2,1	3,5	0,5	0,3	0,3	0,1	0,1	16,1
Business visit	4,7	0,5	1,7	0,3	0,0	0,0	0,0	0,0	7,2
Visiting/staying with friends	9,3	1,6	2,1	1,9	0,1	0,1	0,1	0,1	15,4
Shopping	12,5	3,6	3,1	1,7	0,1	0,3	0,0	0,1	21,5
Education	2,8	2,0	0,1	0,4	0,3	0,3	0,0	0,0	5,9
Recreation/sport	7,4	1,9	1,5	1,6	0,1	0,1	0,0	0,1	12,8
Recreational travel/ strolling	1,9	0,4	0,1	0,1	0,0	0,0	0,0	0,1	2,7
Other	11,0	2,6	3,0	1,6	0,1	0,1	0,0	0,1	18,5
<b>Total</b>	<b>58,7</b>	<b>14,6</b>	<b>15,2</b>	<b>8,1</b>	<b>0,9</b>	<b>1,3</b>	<b>0,4</b>	<b>0,8</b>	<b>100</b>

Source: Kavsek, *The pedestrians' figure book*, The Hague 1998

The OVG's figures as specified in the previous paragraph indicate that about 600 metres per person per day is travelled every day by foot (from a total of about 35 km). When travelling to and from other modes of transport is included that turns out according to table I.8 to be about 1.300 metres (from a total of 37 km). Due to its average lower speed walking occupies a more restricted role. Automobile and public transport trips are dominant. Taking all modes of transport together the greatest distances are covered for travel to and from work. For pedestrians these are shopping and strolling.

**Tabel I.8 The distance travelled each day by purpose and mode of transport, including travel to and from other modes of transport (in km)**

<b>Purpose</b>	<b>By foot</b>	<b>Bicycle</b>	<b>Autom. driver</b>	<b>Autom. pass.</b>	<b>Train</b>	<b>Bus/ tram/ metro</b>	<b>Moped</b>	<b>Other</b>	<b>Total</b>
Home- work	0,13	0,62	5,14	0,89	0,90	0,34	0,08	0,17	8,27
Business visit	0,04	0,05	2,31	0,31	0,12	0,02	0,00	0,03	2,88
Visiting/staying with friends	0,14	0,34	3,13	3,23	0,77	0,20	0,03	0,07	7,91
Shopping	0,28	0,54	1,65	1,17	0,20	0,17	0,02	0,04	4,07
Education	0,10	0,48	0,20	0,21	0,55	0,37	0,04	0,05	2,00
Recreation/sport	0,16	0,43	1,66	2,05	0,43	0,17	0,02	0,18	5,10
Recreational travel/ strolling	0,26	0,39	0,27	0,25	0,05	0,01	0,01	0,08	1,32
Other	0,17	0,35	2,37	1,51	0,30	0,12	0,02	0,10	4,94
<b>Total</b>	<b>1,28</b>	<b>3,20</b>	<b>16,73</b>	<b>9,62</b>	<b>3,32</b>	<b>1,40</b>	<b>0,22</b>	<b>0,72</b>	<b>36,49</b>

Source: Kavsek, *The pedestrians' figure book*, The Hague 1998

## 4. Road Safety

Table I.9 analyzes the number of road deaths under pedestrians for the years 1990 to 1998 by other party involved in the accident. This table shows clearly the declining trend in number of road deaths. The number of deaths from accidents involving no other party is very restricted. More than 50% of the deaths among pedestrians involve an automobile. For this type of accident a declining trend is also perceptible. About 20% of the deaths involve accidents with trucks or delivery vans.

**Table I.9 The development of the number of deaths of pedestrians by other party involved**

No other party involved		Accident involving two parties			Accident involving more than two parties	Total	
		Automobile- delivery van	Truck/ Motorb./ scooter	Other mode of transport			
1990	0	76	22	5	15	26	144
1991	0	65	22	4	19	35	145
1992	2	70	27	5	15	33	152
1993	1	73	16	5	21	31	147
1994	0	60	19	5	19	21	124
1995	0	69	22	4	15	32	142
1996	1	50	17	1	24	16	109
1997	0	55	23	4	23	14	119
1998	0	56	22	0	17	15	110

Source: Transport Research Centre - BG

## Appendix II. Terms Employed

### **automobile/passenger car**

Motor vehicle equipped for the transport of at most eight passengers (excluding the driver).

### **bicycle lanes**

Bicycle lanes are sections along the edge of the carriageway that are intended for bicycle/moped traffic, which have the same surface as that carriageway and are separated from it by an unbroken line. When they are surfaced differently from the carriageway they shall be deemed to be adjacent bicycle paths.

### **bicycle paths**

Bicycle paths are paths that are designated as such with the traffic signs indicating their purpose in conformity with the Traffic Board and Traffic Sign Regulations.

### **bicycle paths with independent trajectory**

This includes all bicycle paths that do not run alongside roads carrying 4-wheel motor vehicles or are separated from them by more than 25 metre.

### **built-up area**

In determining the boundaries of the built-up area the boundaries established by the Provincial Executive pursuant to the Road Traffic Act and the Road Traffic Regulations. These boundaries can be generally recognized by the speed limits stipulated generally beside name boards.

### **hospitalized casualties**

Registered traffic casualties that have been hospitalized as a result of an accident.

### **main mode of transport**

Mode of transport by which the largest portion of the trip is made.

### **modal split**

The distribution of the distance travelled over the modes of transport as percentages.

### **moped**

Bicycle with auxiliary engine that has a maximum cylinder capacity of 50 cc.



**motorbike**

Two/three-wheel motor vehicle (with or without sidecar), for which a motorcycle registration is compulsory.

**motorway**

Road that meets the following criteria:

- a. separate carriageways that are divided by a strip of ground not intended for traffic;
- b. intersections at different levels;
- c. only motor vehicles are admitted; motor vehicles may access the road only via specific inlets that are constructed for that purpose.

**motor vehicle**

Road vehicle with mechanical propulsion, generally used for the transport of persons or goods, with the exception of vehicles that travel on rails or are linked to an electrical conductor; mopeds are excluded.

**multiple trips**

These are frequently occurring trips made by for example postmen, representatives and doctors that have been separately registered and do not therefore appear in all the tables and diagrams.

**other casualties**

Registered traffic casualties who have not been hospitalized as a result of the particular accident.

**OVG**

The 'Onderzoeksverplaaatsingsgedrag' (OVG) [Study of Travel Movements], that is held every year by questionnaire.

**police records**

The police keep records of all kinds of details relating to felonies that they detect.

**purpose**

The purpose of a trip is determined by the activity at the destination address unless that activity is 'residence', in which case the activity at the address of origin shall be determinant for the purpose.

**road deaths**

Victims that have died as a result of a traffic accident.

**stage**

Part of the trip that is made by one mode of transport.

**surfaced roads**

Roads open to public traffic that have been provided with a surfaced top layer.

**(Second) Transport Structure Plan (STP II)**

Policy document of the Dutch government from 1990 (government decision).

**traveller-kilometre**

Unit of measurement for transport performance that corresponds to the transport of one traveller over a distance of 1 km.

**trip**

Movement or part of a movement with one purpose, for which transition to another mode of transport does not count as new trip.

**unsurfaced roads**

Roads open to public traffic that are provided with an unsurfaced natural top layer (cuttings) or a loosely deposited top layer (sand and gravel roads). Paved roads are classified as surfaced.

**vehicle-kilometre**

Unit of measurement for traffic performance that corresponds to the distance travelled by one vehicle over a distance of 1 km.

**Explanations of Symbols**

. = data lacking

nothing (blank) = for logical reasons a figure cannot appear

Due to rounding off the totals may not correspond exactly to the sums of the figures.

**Sources**

- CBS (Central Bureau for Statistics, Heerlen);
- NS (Nederlandse Spoorwegen, Utrecht);
- Bovag-Rai, 'Mobility in figures' (automobiles and two-wheeled vehicles) 1999;
- TRC (Transport Research Centre), Rotterdam).

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