



city document

Utrecht, The Netherlands

traffic, transport and the bicycle in
Utrecht

URB-AL R8-P10-01

'Integration of bicycles in the traffic engineering of Latin American and European medium sized cities. An interactive program for education and distribution of knowledge'

European Commission EuropeAid Co-operation Office

A study of the city of Utrecht, the Netherlands



The tower of the Dom church and the Oudegracht canal form the medieval heart of Utrecht.

1 Introduction

1.1 General characteristics of the city

Utrecht is, after Amsterdam, Rotterdam and The Hague, the fourth largest city in the Netherlands, with a population of approximately 258,000. Utrecht is the capital city of the province of Utrecht. The city lies in the heart of the Netherlands, at an intersection of roads, railways and waterways. The city is very old: it was founded by the Romans in around 47 AD. The city was at that time situated on the Rhine, which formed the northern frontier of the Roman Empire.

The city is located in flat country, surrounded by satellite towns with grassland to the west and forested areas to the east. Utrecht forms part of "Randstad Holland", the conurbation in the west of the Netherlands that is formed by the four large cities of the Netherlands and their satellite towns.



Symbols for old Utrecht: Dom church and the Oudegracht canal.

The Netherlands is densely populated, with a total population of around 16 million. The population density is 457 inhabitants per km². A closely-knit network of motorways and railways connects the most important cities and regions in the Netherlands.

Utrecht is a city of education: the university and colleges have in total more than 55,000 students. Furthermore, Utrecht is a city for congresses. The Jaarbeurs, the largest congress and exhibition complex in the Netherlands, is located in the centre of the city.



*In the centre of Utrecht the old and new border on each other.
The medieval Dom tower is within a stone's throw from the
'Hoog Catharijne' shopping and business centre.*

History of the city

Utrecht arose from a Roman fort or *castellum*. At that time, Utrecht lay on the Rhine, which formed the northern frontier of the Roman Empire. The Romans called Utrecht Traiectum, which means "a fordable place in the river".

In 935, Utrecht became the seat of the bishop and as a result the centre of the northern Low Countries. Utrecht still houses the official residence of the bishop. A large number of churches in the city are the result of this. The tower of the Dom church is the highest church tower in the Netherlands at 112 metres.

The University of Utrecht was established in 1636 and from that time has been the largest and most important University in the Netherlands.

At the end of the nineteenth century, Utrecht developed into an industrial city, with the metal industry being the main sector. In the 1970's, the metal industry disappeared from the city almost completely. Until 1840, the city mainly lay within the outer canals and the city walls. After the demolition of the city walls, the city expanded to outside of the outer canals. The city reached its current size after boundary changes in 1954 and 2001.

The population of the city remained steady at 30,000 for centuries until 1800. After this, it grew steadily to the current level of 258,000 inhabitants.

Through the centuries, Utrecht has always been an important traffic intersection. Until the mid nineteenth century, all of the traffic was by water, with Utrecht being connected to a large part of western Netherlands by rivers and canals. After that came the railways. Very soon, Utrecht became the location of the major railway intersection in the Netherlands. In the 1930's, work was started on the construction of motorways. Utrecht is now encircled by motorways.

1.2 Demographic characteristics

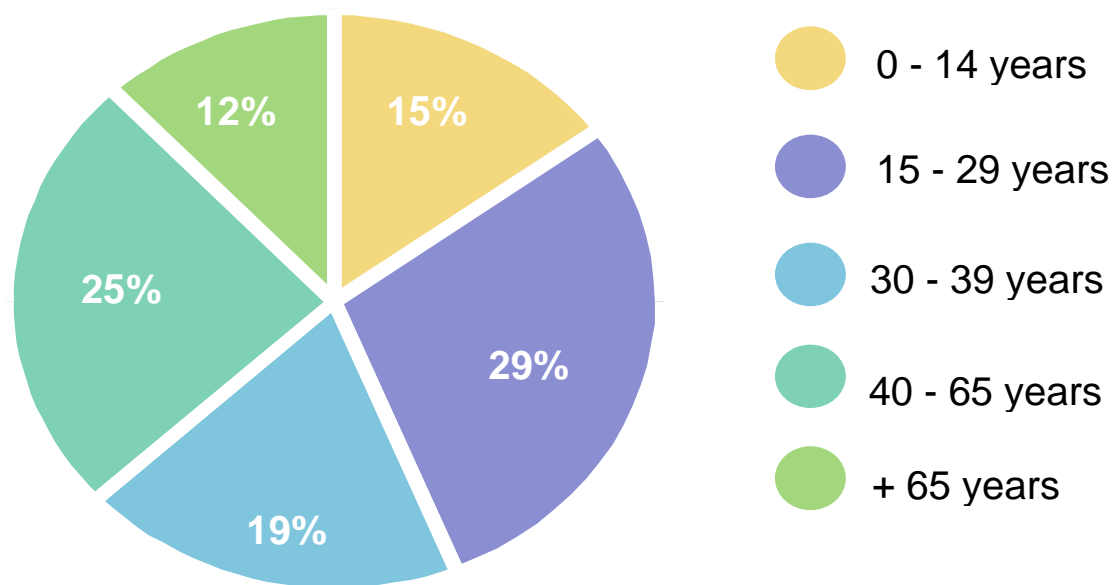
Utrecht has now in 2002 258,000 inhabitants. Utrecht will continue to grow to 335,000 inhabitants in 2015. After this the expectation is that the number of inhabitants will stabilise.

Approximately 30% of the total population is made up of minorities. There are people from around 200 ethnic groups, with Moroccans, Turks, Surinamers and Antilleans making up more than half of the total.

When compared to the other large cities in the Netherlands, Utrecht is a relatively young city.

Approximately 45% of the population is younger than 30. Of the 55,000 students in higher education, 28% live in the city itself.

A city of youngsters



The age distribution of the population of Utrecht (2000).

1.3 Geographic characteristics

Because of its central location in the Netherlands, Utrecht is **the** traffic intersection of the country. The most important Dutch motorways intersect close to the city and form a ring that closely surrounds it. The most important Dutch railway lines also meet in Utrecht. Utrecht's central station is therefore the busiest station in the Netherlands, with 114,000 people arriving or departing every day.

Utrecht lies on the Amsterdam – Rhine Canal. This canal forms the connection between the seaport of Amsterdam and the German Ruhr region, one of the world's largest industrial areas. As a result, the Amsterdam – Rhine canal is one of the busiest canals in the world.

Various satellite towns (Maarssen, De Bilt, Zeist, Bunnik, Houten, Nieuwegein, and IJsselstein) are situated close to Utrecht. The whole agglomeration has 500,000 inhabitants.

The distance between Utrecht and the other large cities in the Netherlands is not large. Amsterdam is 35 kilometres from Utrecht, Rotterdam 50 kilometres and The Hague 60 kilometres. The cities are connected by motorways and railways. The seaports of Amsterdam and Rotterdam are accessible from Utrecht by water.



Utrecht lies in the heart of the Netherlands

1.4 Economic characteristics

Utrecht is a characteristic educational and congress city. Furthermore, the emphasis lies on the service sector (banking, insurance and information technology) and the transport sector (distribution). The heavy metal industry disappeared from the city in the 'sixties and 'seventies. From the economic viewpoint, Utrecht is the most dynamic city in the Netherlands. Unemployment is 3% (nationally 3%).

Utrecht has 217,000 jobs. More than 58% of the employment in the city is in the commercial service sector (trade, transport, communications, financial institutions and commercial services). About 32% of employment is in the non-commercial services sector such as public administration, education, the health service and culture. Only 10% of all jobs are found in industry and construction. In total there are 15,700 companies registered in the city. Office space of 2,000,000 m² is available. In the coming 10 years, the expectation is that this will increase by 700,000 m².



The “Lage Weide” industrial estate.



Offices to the west of the central station

Furthermore, Utrecht is important for its shopping. The covered shopping centre “Hoog Catharijne” that accommodates more than 200 shops is the busiest shopping centre in the Netherlands. This shopping centre was built in 1960-70 and forms a connection between the central railway station and the shopping heart of the old city. As many as 44% of the shoppers come from outside the Utrecht region.

1.5 Institutional antecedents and history

In Utrecht, the development of the traffic and transport policy is a responsibility of the City Planning Department with the management and maintenance of the infrastructure being a responsibility of the City Management Department.

The Traffic section within the City Planning Department provides advice on all traffic and transport issues to the municipal administration and the various project organisations that are active within the municipal organisation. Furthermore, the traffic section develops policy proposals and carries out research. The most important areas of policy concern the traffic infrastructure, the moving car, the parking of cars, the moving bicycle, the parking of bicycles, public transport, commercial transport, traffic safety, dynamic traffic management, and traffic control.

A number of cities in the Netherlands, including Utrecht, have appointed a bicycle coordinator. Bicycle coordinators can be appointed for both development and management. Utrecht only has a bicycle coordinator for the development of the bicycle policy. The bicycle coordinator in Utrecht is engaged in the development of the bicycle policy plans, providing advice to the municipal administration, planning and programming bicycle projects, internal discussion (especially with the road maintenance authority and the various municipal project organisations) and external discussion (mainly with interest groups and other areas of government). The bicycle coordinator function is not a full-time task. Annually, 250 hours are allocated for it. The person who fulfils this task (since May 2000 this has been Ruud Ditewig) combines the bicycle coordinator function with providing advice and policy development in all areas of traffic and transport.

The function of the bicycle coordinator was created in Utrecht in 1992. The bicycle policy document that appeared that year laid the basis for this function.

2 Traffic and transport

2.1 Description of the actual traffic and transport situation

2.1.1 Description of the actual situation

Despite the fact that Utrecht lies at the junction of motorways, there is very little through traffic in the city. All through traffic is routed around the ring of motorways that encircles the city. The majority of the city lies within this motorway ring. Until recently, any expansion of the city occurred within the ring. Between 1998 and 2015, 30,000 new homes, 300,000 m² of office space and 280 hectares of industrial estate will be built to the west of the city in the greenfield site of “Leidsche Rijn”.



The “Papendorpse” bridge to “Leidsche Rijn”.



The “Europalaan”, one of the traffic radials from the motorway ring to the centre.

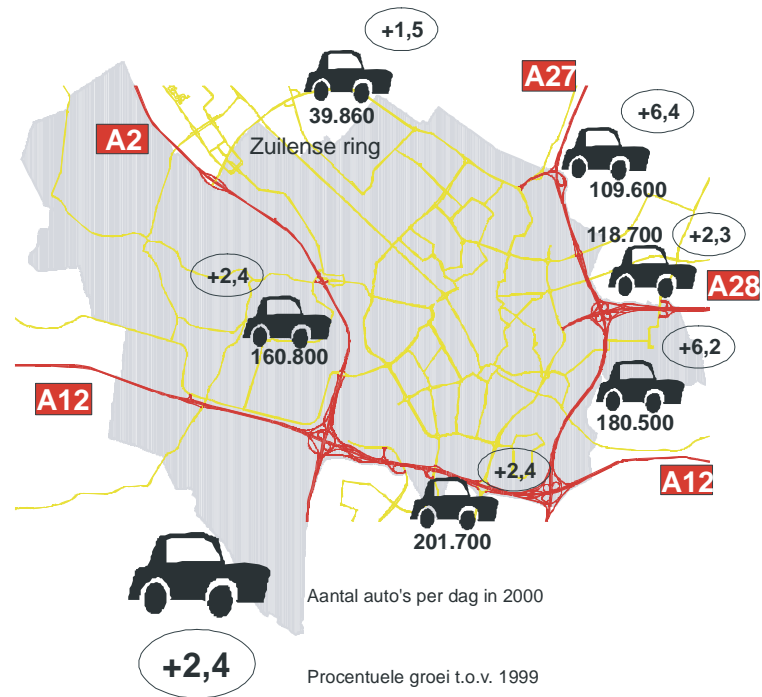
The traffic structure in the city is mainly radial, with radials running from the motorway ring to the centre of the city.

	car driver	car passenger	train	bus, tram	moped	bicycle	walking	other
Utrecht	19%	11%	5%	4%	1%	33%	25%	1%
Netherlands	31%	17%	2%	3%	1%	27%	17%	1%

The number of movements by main method of transport (modal split), 1998.

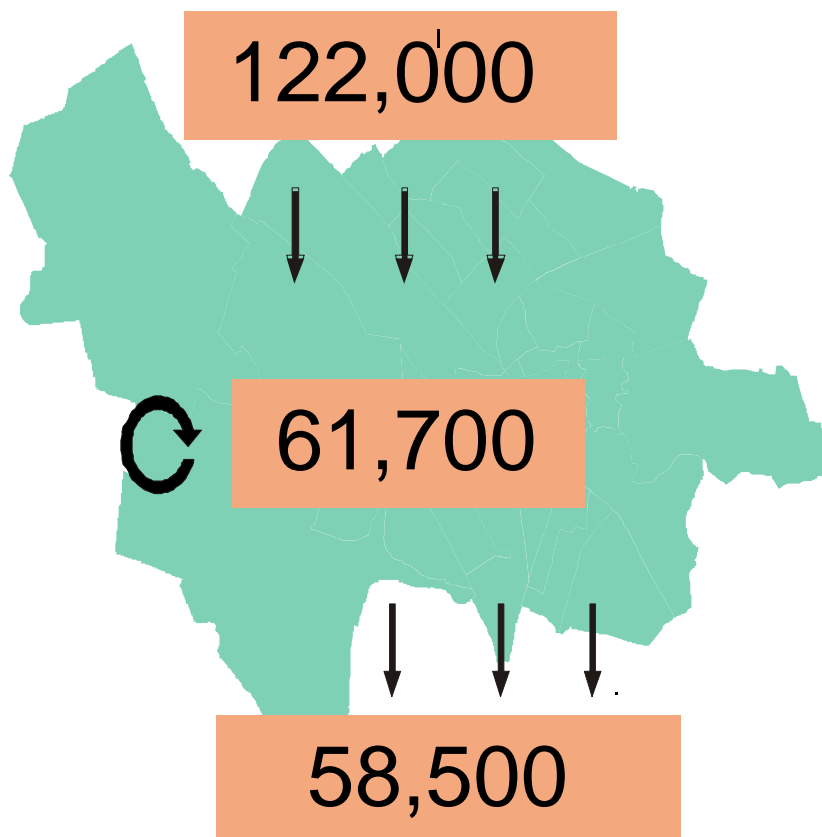
2.1.2 Vehicle Congestion

The traffic in and around the city is congested in two areas. In the morning and evening rush hours there are long traffic jams on the motorway ring, because the through traffic interacts with the local traffic that makes use of the motorways. In the national list of the top 25 traffic jams Utrecht appears 5 times.



The number of vehicles that used the motorways around Utrecht in 2000.

Utrecht has a large amount of commuter traffic. This causes major traffic jams on the incoming roads in the morning and the out-going roads in the evening. In general it can be said that the traffic congestion is worse on the outskirts of the city and not as pronounced in the centre.



The incoming and outgoing commuter traffic. There are 122,000 employees from outside of Utrecht, 61,700 employees live and work in Utrecht and 58,500 people from Utrecht work outside of the city.

2.1.3 Parking space

In the centre of the city and in the surrounding older districts, both residents and people from outside of the city must pay to park.

There are numerous garages around the “Jaarbeurs” exhibition centre, the “Hoog Catharijne” shopping centre, and in the old city centre. A dynamic parking system indicates to the motorist which car parks still have vacant places.

In the coming years, Utrecht will develop a number of “transferia” on the outskirts of the city. A transferium is a car park close to the motorway ring around the city that offers a fast and frequent public transport connection. A transferium has already been created to the south of the city. The rapid tram from Utrecht to Nieuwegein provides the public transport. There are plans for three other transferia around the city. A study will be made as to whether the bicycle (bicycle rental in the transferium) can play a role in transport from the transferium to the final destination.

2.1.4 Public transport

From the central station in Utrecht, railway lines run in six directions. The most important cities in the Netherlands are accessible by train from Utrecht with services running every 15 or 30 minutes. The train plays a role not only in long distance transport to the rest of the Netherlands, but also in the commuter transport within the region. There are 22 stations within a radius of 15 kilometres around Utrecht, with 4 in the city itself. In the next few years, 7 new stations will be opened in and around the city to make a system of frequent train services (“Randstadspoor”) in the region possible. To achieve this some of the railway lines will be extended to four tracks.



Utrecht Central station. With 114,000 people arriving and departing every day, this is the busiest station in the Netherlands. All of the regions of the Netherlands can be accessed by train from Utrecht.

The satellite towns of “Nieuwegein” and “IJsselstein” are linked to the central station in Utrecht by a rapid tram connection. The tram connection, which was opened in 1982, transports 27,000 passengers a day.



The bus station adjacent to the Utrecht central station. This is where the majority of city and regional bus lines meet. The rapid tram line to the satellite towns of “Nieuwegein” and “IJsselstein” also terminates here. The photo on the left shows one of the new 24-metre-long double articulated buses.

Local public transport in Utrecht is made up of city and regional bus lines. A network of high-quality bus lanes is being created for the long distance transport in the city. Approximately half of this network has been completed. Since September 2002, 24-metre-long double articulated buses have provided a service on some of these bus lanes. The bus lanes have been created in such a way as to make them suitable for use by trams in the future.

The bus station adjacent to the central station in Utrecht handles 50,000 passengers a day. In the city 90,000 passengers are transported by bus every day.



The high-quality public transport lane on the “Vleutenseweg”. One of the sections of the bus lane network that has already been realised. From left to right the photo shows a parallel road, a bicycle path, a grass verge, the main road, the bus lane and the central reservation of the road

2.1.5 Public space

The municipality of Utrecht covers a total of 9,195 hectares. In 2002, the built-up area of the city occupies approximately half of the municipality. The building density in the city is 125 houses/ hectare. The centre of Utrecht consists of the historic heart on the one hand and the modern business and shopping centre around the central station on the other. A ring of nineteenth century districts surrounds the centre of the city. These are in turn surrounded by a ring of districts that were built between 1945 - 1990. A number of districts with many high-rise buildings dominate here.



City expansion in the 1960s: "Kanaleneiland".

Utrecht is not a typical park city, but it does have a number of large and small parks. There are very few large squares in the city.

The industrial and commercial estates are located on the outskirts of the city. These are linked to the motorway ring. There is a large industrial estate along the Amsterdam - Rhine canal that is accessible from this canal.

The shopping area in the centre is predominantly a pedestrian precinct. The remainder of the centre has little traffic. It is not possible for through traffic to pass through the centre of the city. The majority of the residential areas have also been arranged so that there is little traffic. Through traffic is routed over the main roads. By taking measures to reduce speed and measures to improve traffic circulation, motorised traffic is kept away from the residential districts.



A traffic circulation measure: one-way traffic, the bicyclists can ride in both directions (Leidseweg).

In general, the roads in Utrecht are narrow. The majority of main roads have 2 or 4 lanes. However, the main roads nearly always have bicycle paths or bicycle lanes and pavements. Approximately 150 traffic control installations control the traffic at the most important junctions in the city.



A road profile with bicycle lanes (Catharijnesingel) and a road profile with adjacent bicycle paths (Nobelstraat).

2.1.6 The actual situation of non-motorised transport (cycling and walking)

Bicycle policy

In 1992, a bicycle policy document was adopted in Utrecht, it was updated and re-adopted in 2002. The bicycle policy document consists of three parts: the policy, the main bicycle network and the programme of requirements. The policy chapter lays out the general framework and objectives. The main objective in Utrecht is to retain the relatively high proportion of bicycle traffic in the modal split. As a result of the physical growth of the city, which in turn makes the distances to bicycle ever greater, the proportion of bicycle traffic will decline if the policy remains unchanged.

The specifying of a main bicycle network is not only important for completing the (physical) network, but mainly also for its management and maintenance. Management and maintenance is more than just maintaining provisions; it also means retaining the safety and attractiveness of a route.

The programme of requirements is an instrument that allows the realisation of bicycle provisions with a certain quality. The programme of requirements includes regulations that concern dimensions, material use and other design requirements for bicycle routes.

An investment programme is linked to the bicycle policy document.

Bicycle use

The growing use of the car has a number of unfavourable side effects, such as use of space, the emission of hazardous substances and traffic nuisance, including noise. Moreover, the car forms, as a result of its speed, a threat to traffic safety, mainly for vulnerable traffic participants such as pedestrians and bicyclists.

But despite the growth in car use, the bicycle still fulfils an important function in the pattern of movement in Utrecht. For instance, the bicycle is used for more movements than public transport. These are mainly movements over a limited distance (up to approximately 7.5 km). For such distances the bicycle is an ideal method of transport because of its flexibility. Of the current car journeys, about half are also for short distances. The bicycle can in principle take over a large proportion of these journeys and as a result can make a major contribution to limiting the use of the car.

Bicycling and walking as the main method of transport in Utrecht each account for a large percentage of movements, respectively 33% and 25% (the average in the Netherlands is respectively 27% and 17%). These modes of transport are mainly dominant for movements over short distances, but even so a third of the movements up to 7.5 kilometres are made by car; a large number of these movements could also be made on foot or by bicycle. The car is for 30% and public transport for 9% the main method of transport.

Although the bicycle's share of the total number of movements is 33%, up to a distance of 5 kilometres this is 42%. The bicycle's share reduces considerably above a movement distance of 5 kilometres.



Examples of the introduction of bicycle provisions in the city: The retention of a tree in a bicycle path (Ledig Erf) and the realisation of a bicycle lane (without a legal status) in an inner city regeneration area (Herman Gorterstraat). Note with the latter the parking arrangements.

Traffic safety

The traffic safety figures in the Netherlands are recorded centrally by the government. The percentage number of fatalities recorded is 100%, for casualties that go to hospital 70% and for other casualties 25%.

In 2000, in Utrecht there were 931 traffic casualties (fatalities and injured) from 770 accidents. The share of bicyclists in this total is 27.8%. The average share in the whole of the province of Utrecht (1,107,889 residents in 33 municipalities) is 29.1%. Utrecht therefore does not differ much from the average.

There are 38 black spots in Utrecht. These are places where in a period of three years, six or more accidents resulting in injury occurred.

	NUMBER OF ACCIDENTS	NUMBER OF VICTIMS	PERCENTAGE BICYCLISTS
City of Utrecht 1 municipality, 253,825 inhabitants	770	931	27.8%
Province of Utrecht 33 municipalities, 1,107,889 inhabitants	2,886	3,534	29.1%

Traffic accident figures for 2000

The traffic safety programme Sustainably Safe operates in the Netherlands. The municipality of Utrecht participates in this programme. An important activity in the framework of Sustainably Safe is the categorisation of roads and the resulting division of public space into traffic areas and residential areas. This is the basis for setting up 30 km/hour zones in the residential areas. The most widely used measures for setting up 30 km/hour zones are, apart from the traffic measures themselves, the taking of speed limiting measures and measures for excluding through traffic from residential areas (traffic circulation plan).

Infrastructure

In Utrecht there are provisions for the *moving bicycle* and provisions for *parking bicycles*. There are bicycle paths along the majority of main roads in the city. The bicycle paths are, wherever possible, on both sides of the road. Two-way traffic is allowed on a large number of bicycle paths. The paths are in principle surfaced with asphalt. In the Netherlands, the surfacing of bicycle routes is normally red. The letters on signposts for bicycle routes are also in red on a white background. Older paths and paths that run over numerous cables and pipes are surfaced with paving stones.



Utrecht has a very wide range of bicycle provisions: from substantial infrastructure such as a bicycle tunnel (Europalaan) to a very simple provision such as concrete blocks used to separate the bicycle path from the road (Stationsplein).

The provisions for the moving bicycle are generally:

- bicycle paths
- bicycle lanes
- bicycle suggestion lanes (bicycle lanes without a legal status)
- traffic priority arrangements to the advantage of the bicyclist
- parking prohibited for cars on the bicycle lane
- traffic control installations
- bicycle bridges and tunnels
- signposts for bicycle routes.

Bicycle theft is a major problem. In 1998, 11,193 bicycles were reported stolen in Utrecht. This is the largest number of all of the large cities in the Netherlands. These are just the cases where the owner reported the theft to the police (the actual number of thefts will be several times more). The theft of bicycles can be reduced to a degree by creating well-guarded and unguarded bicycle parking and bicycle clamps.

The provisions for parking bicycles comprise:

- bicycle clamps and racks on the street
- indoor local parking in residential areas
- bicycle parking at companies
- guarded bicycle parking in shopping centres, stations, etc.



Parking provisions at stations consist of guarded bicycle parks (at the central station in Utrecht there are four guarded bicycle parks with in total 7,000 places) and unguarded bicycle parks outdoors.



Around stations there is also a lot of unofficial parking of bicycles (Stationsplein and Jaarbeursplein)

2.2 Description of actual and existing policies

2.2.1 Objectives and policy on urban growth

In Utrecht the intention is to realise a “dynamic city”. A dynamic city benefits from good accessibility: for new spatial - economic developments accessibility should also be guaranteed.

After 2010, 50,000 homes and 1.8 million m² of office space must be added to the metropolitan district of Utrecht. This will lead to more traffic on the motorways around the city. From the traffic point of view, the desire is to plan the functions that attract lots of traffic around areas where the car and public transport intersect in the outskirts of the city or in the immediate vicinity of the city.

The choices made in the area of spatial development and in the area of traffic and transport should take each other into account. Only then can there be an alignment of spatial planning and traffic, and the only then can the opportunities offered by both be exploited.

2.2.2 Traffic and transport politics

A new municipal traffic and transport plan will be adopted for Utrecht in 2003. The aim is to maintain and/ or improve the accessibility where that is desired and to facilitate the mobility needs where possible (the quality requirements associated with liveability can however lead to limiting the facilitating of the mobility needs).

The growth in mobility must be able to be accommodated throughout all of the networks for cars, bicycles, public transport and vessels. In addition, transferring between the different systems at modal intersections will be promoted.

2.2.3 Objectives of traffic plans

The growth in mobility must be able to be accommodated throughout all of the networks for cars, bicycles and public transport. The inconvenience of the motor-traffic (safety, pollution) must be decrease.

2.2.4 Public transport politics

The public transport policy has two functions: offering a good alternative to the car (the mobility function) and the social function (for instance for people without a car).

From the viewpoint of the mobility function, the aim is to increase the use of public transport by offering more rapid lines (using railway connections or bus lines that make use of dedicated infrastructure).

From the viewpoint of the social function the aim is to improve (for instance, re-route or increase the frequency of) the lines that open up the area where people live. Moreover, the aim will be to realise public transport modal intersections (including bicycle routes) and modal intersections between public transport and the car on the outskirts of the city, so that it is possible to transfer from car to public transport (using a transferium) before entering the city.



Utrecht is connected to the European railway network. Here is the train from Amsterdam - Cologne (Germany).

2.2.5 Statutory regulations and organisation

Statutory regulations

In the Netherlands, the bicyclist has a legal status that is laid down in the Road Traffic Act (a bicyclist is a “driver/ rider” just like a car driver, motorbike rider and a moped rider). The Road Traffic Act contains traffic regulations that are applicable in the Netherlands, as well as the requirements that are placed on the equipment of the bicycle (brakes, lights, etc.).

The responsibility that the road maintenance authority has with respect to the condition of the road is arranged in the Road Traffic Act.



Traffic regulations are displayed on signs. Not only the obligatory bicycle path or one-way traffic, but also a priority situation that benefits the bicyclist (Joseph Haydnlaan).

Organisation

The most important road maintenance authorities are the State, the provinces and the municipalities. A small proportion of the road network in the Netherlands is managed by the water authorities and a very small proportion by private individuals.

In a number of urban areas in the Netherlands, a fourth management layer has been introduced: the regions. These regions mainly have responsibility in the area of traffic and transport. In these areas the region is the public transport authority and is also the body that distributes the State subsidies to the municipalities that form the region.

The responsibility for bicycling is in the majority of municipalities split into *development* and *management*. In practice this means that a policy department (in Utrecht this is the City Planning Department) is responsible for the development of the bicycling policy and that a management department (in Utrecht this is City Management Department) functions as the road maintenance authority. The road maintenance authority is responsible for the design and execution of bicycle provisions and for the maintenance of bicycle provisions.



Examples of bicycle provisions: at the intersection Bleekstraat – Catharijnesingel the bicyclists are routed around the intersection. On the Graad van Roggenweg the bicycle path forms part of a newly-built office complex.

3 General focus of the study

3.1 Objectives

The bicycle policy document from 1992 was updated in 2002. The policy with respect to the bicycle focuses on retaining the high proportion of movements by bicycle in the total number of traffic movements. Because the city will continue to grow until 2015, which will cause the physical distances to increase, if nothing is done the use of the bicycle is expected to decline.

To achieve the aim of retaining the high proportion of bicycle movements, various instruments are available: a specified main bicycle network, a programme of requirements, and an investment programme. These instruments will be used to improve the quality of the existing provisions and to construct missing links in the network. The result is that the travelling speed on the network will increase, safety and attractiveness will increase and the detours will be reduced. This should result in an increase in bicycle use, especially for the longer distances (3.5 – 7.5 kilometres).

3.2 Socio-economic factors

The demographic composition in Utrecht differs significantly from the average in the Netherlands and in the other large cities. For instance, the number of higher educated people is high: 53.6% against an average of 36% for the other large cities and 26.8% for the whole of the Netherlands.

The age group between 20 and 30 is also strongly represented: 39.5% against an average of 31.5% for the other large cities and 27.6% for the whole of the Netherlands.

The age group 65+ is on the other hand under represented: 12% against an average of 14.4% in the other large cities and 17.5% for the whole of the Netherlands.

	Utrecht	other large cities	Netherlands
higher educated	53.6%	36.0%	26.8%
20 – 30 years old	39.5%	31.5%	27.6%
65+ years old	12.0%	14.4%	13.6%
foreigners	30.8%	43.4%	17.5%
unemployed	3.0%	6.0%	3.0%

The most important differences in demographic characteristics with respect to other large cities in the Netherlands and with respect to the whole of the Netherlands (2000).

4 The study

4.1 Characteristics of the actual cyclists

Note: All numbers and facts in chapter 4 are the average in the Netherlands, unless stated otherwise. The figures therefore concern the whole of the Netherlands and not only the city of Utrecht, unless stated otherwise.

4.1.1 Age and gender

Of the approximately 16 million inhabitants of the Netherlands, 49.4% is male and 50.6% female.

The possession of a means of transport per age category:

Age	Bicycle	Car	None
10 – 15 years	93.1%	0%	6.9%
20 – 25 years	79.8%	29.5%	8.1%
40 – 50 years	83.5%	62.4%	3.9%
65 – 75 years	77.9%	47.6%	13.0%

The percentage possession of a means of transport per age category (1999).

4.1.2 Education level

There is currently no information available for the Netherlands and the city of Utrecht concerning the educational level of bicyclists. Because all levels of the population use bicycles, the expectation is that all levels of education will be proportionally represented.

Because of Utrecht's position as a university and educational city and as a centre for commercial services and information technology, the proportion of higher educated people in the total population (53.6%) is much higher than the average in the Netherlands (26.8%).

4.1.3 Occupation and economic situation

Unemployment in Utrecht (3%) is lower than in the three other large cities in the Netherlands (6, 7 and 5%) and equal to the national average (3%). Any relationship to more or less bicycle use is unknown.

4.1.4 Motives for using the bicycle

Motives for using the bicycle:

Commuting	Shopping and recreation	Education	Other	Total bicycle	Total of all modes of transport
0.18	0.43	0.08	0.10	0.79	3.15

The average number of movements by bicycle per person per day by motive (1999).

4.1.5 Most frequent origin and destinations

The origin and destination of the bicyclist have a direct relationship to the motive. The bicycle plays a role not only as the main mode of transport, but also as a means of getting to and from the station at both ends of the journey when the train is used:

	Bicycle	Walking	Car (incl. passengers)	Bus/tram/metro	Other
Transport to station from origin	30%	24%	14%	31%	1%
Transport from station to destination	8%	46%	9%	32%	5%

The choice of the means of transport to and from the station when the train is used (1999).

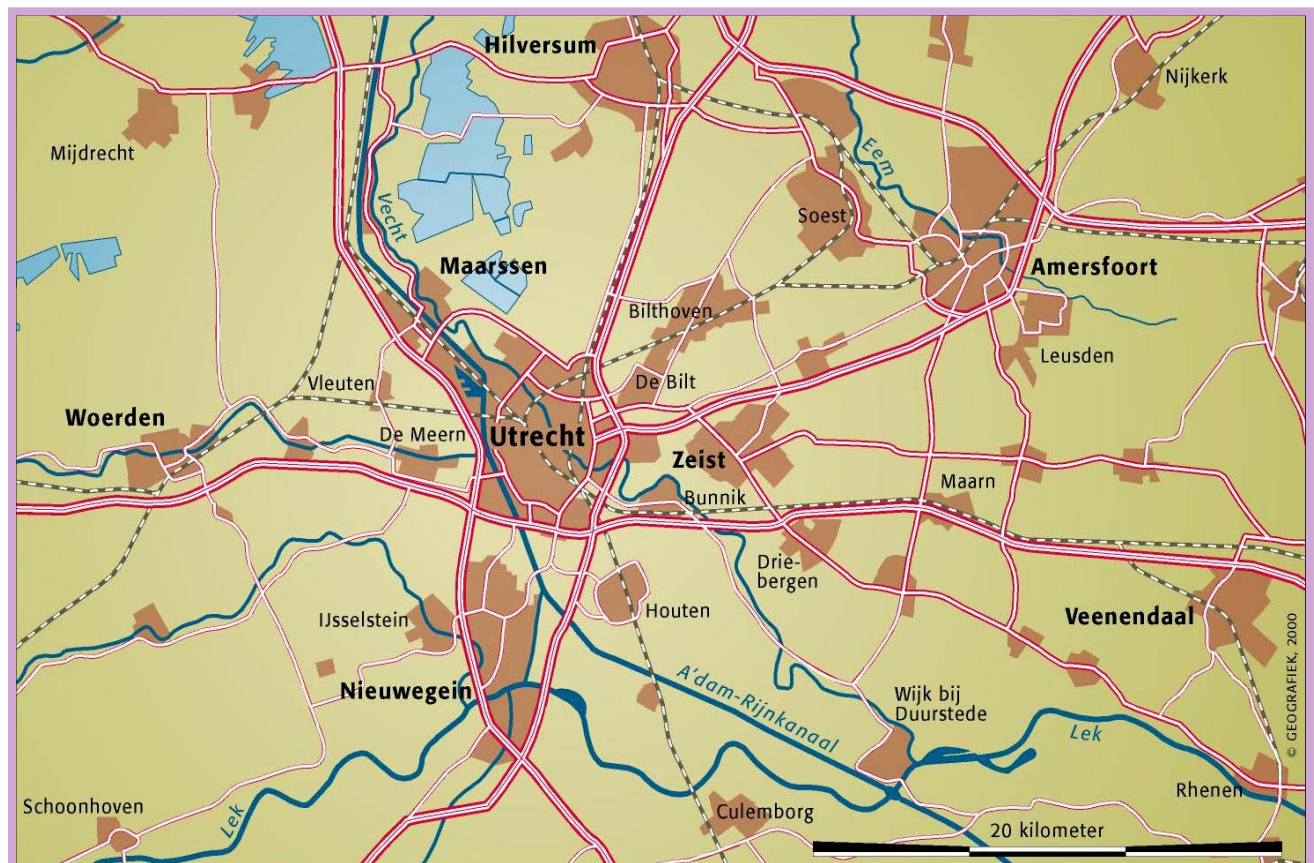
4.1.6 Estimation of number of bicycles in the city

The number of people possessing a bicycle in the Netherlands is 840 per 1000 inhabitants. Because many have more than one bicycle, the number of bicycles (approximately 20 million) in the Netherlands is higher than the number of inhabitants (16 million). Each year 1.3 million new bicycles are sold.



The bicycle is to be seen on the streets of Utrecht and the Netherlands in very large numbers. A queue of bicyclists at a traffic light on the Stationsplein and 100% occupied bicycle racks on the Jaarbeursplein.

The regional network



5 Potential for bicycle use

5.1 Strengths when promoting bicycle use

- The advantages of the bicycle (environment, health, traffic safety, improved accessibility, economics) are clear and are generally accepted.
- The Netherlands has a long tradition of being a nation of cyclists and a high proportion of the population ride bicycles. Because of this, the cycling “product” does not need to be brought to the attention from scratch.
- As a result of advanced social integration, all population groups are prepared to cycle, from uneducated labourers to government ministers.
- The Dutch spatial planning policy has created favourable conditions for the development of a bicycle-friendly climate.
- Being able to have a say and the participation of interest groups is strongly developed, meaning that measures can often rely on sufficient support.

5.2 Weaknesses when promoting bicycle use

- The cyclist has a limited action radius. In general this is 5 kilometres. Above 7.5 kilometres, the bicycle share in the modal split is extremely limited.
- Because the bicycle is so “normal” in the Netherlands, large investments in the quality of the bicycle network are often considered unnecessary. The bicycle is the victim of its own success.

5.3 Opportunities when promoting bicycle use

- In urban areas, the bicycle is often the fastest mode of transport over short distances.
- In the large urban areas, the chain of bicycle – public transport – bicycle offers the opportunity of increasing the bicycle share if the link between bicycle - public transport is improved by more and improved parking facilities for bicycles at stations and by making public transport accessible to the cyclist.
- Good and cheap parking facilities for the bicycle increase the bicycle share, especially in city centres.
- Bicycle infrastructure (for instance, two-way 4-metre-wide bicycle paths) have a large capacity and can be created cheaply when compared to the infrastructure required for vehicles.

5.4 Threats when promoting bicycle use

- As a result of the growth of urban areas, the distances to be covered will become longer which will result in the bicycle losing ground in favour of the car and public transport.
- In the Netherlands, the car is also still the dominant means of transport, meaning that the interests of the cyclist are always weighed up against the interests of the car user.
- It appears difficult to increase the bicycle share by taking share from the car. An increase in bicycle use is normally at the expense of public transport.
- Immigrants often do not originate from cultures in which bicycling is normal.
- The road manager considers the large number of bicycles parked by the side of the road undesirable. Sometimes measures are taken to prevent bicycles being parked by the side of the road.

6 Policies for promoting bicycle use

6.1 How to start?

A policy for promoting cycling must be supported by the administration. This means that there must be a document, produced by the administration, that will act as a bicycle policy document. Such a document must never be an end in itself, but must be seen as a starting point.

At the minimum, the following aspects must be covered by the bicycle policy document:

- The objective of the bicycle policy (what you want to achieve with it);
- The instruments that will be used to achieve this objective (infrastructure, promotion, education, etc.);
- How you will achieve this objective (providing strong direction or more by following social developments, autonomously focused on the cyclist or more integrated in normal traffic and transport developments, from a “cycling department” within the local authority organisation or integrated in all local authority departments that have to deal with roads and traffic);
- The current main bicycle network (important in connection with road management) and a desired network for the medium-long term (important in connection with planning and prioritising);
- A programme of requirements for the bicycle facilities.

When implementing a bicycle policy, you are always dependent on third parties. A local authority department that is occupied with the bicycle policy is always only one link in a much larger network. The document mentioned above is indispensable to be able to convince and direct all of the players involved. Who is involved with the bicycle policy, apart from the “traffic department”?

- Departments that are involved in spatial planning, town planning and land use;
- Departments that are involved in the use of financial resources (planning and programming);
- Departments that are concerned with economic affairs and companies;
- The road manager;
- The police;
- Neighbouring local authorities;
- Other authorities, especially when finance and subsidies from other authorities are involved.

Despite the fact that the Netherlands is traditionally a cycling country and that Utrecht has a high bicycle share in the modal split, Utrecht created bicycle policy documents in 1992 and 2002. An unchanged policy will result in the bicycle share falling, as a result of all sorts of developments.

6.2 Objectives

The Utrecht bicycle policy has two objectives. The first objective is to retain the high bicycle share in the modal split. At the moment, the bicycle has a 33% share in all of the means of transport and even a share of 42% where journeys of less than 5 kilometres are involved. The city will however grow strongly until 2015. The built-up area will nearly double. The maximum distance to cycle within the built-up area is currently a maximum of 9 kilometres. In 2015, this will be 14 kilometres. Research has shown that the bicycle share in the modal split above 7.5 kilometres decreases strongly. This means that measures must especially be taken to retain bicycle use in the segment between 5 and 7.5 kilometres. You do this by, among other things, reducing the distance needed to detour around obstacles and by increasing the average journey speed (particularly by reducing the waiting time at traffic control measures). The situation is that the distance to travel is not the only aspect that determines the action radius of the cyclist, but aspects such as journey speed, the probability of stopping, waiting times and comfort also play a role.

The second objective of the Utrecht bicycle policy is the integration of the bicycle in the whole traffic and transport system. Car, bus, tram, train, bicycle and pedestrian all have their own place in the

traffic and transport system. After all, not every car journey can be replaced by a bicycle trip. The task is therefore to find the most optimum balance. A better balance must also be found in relationship to public transport. At the moment, in urban areas the bicycle and public transport are competitors. An increase in bicycle share occurs mainly to the detriment of public transport and vice versa, while when the distances in the urban area increase, these two methods of transport should support and complement each other. Making regional rail transport accessible to bicycles is one of the measures that can be considered.

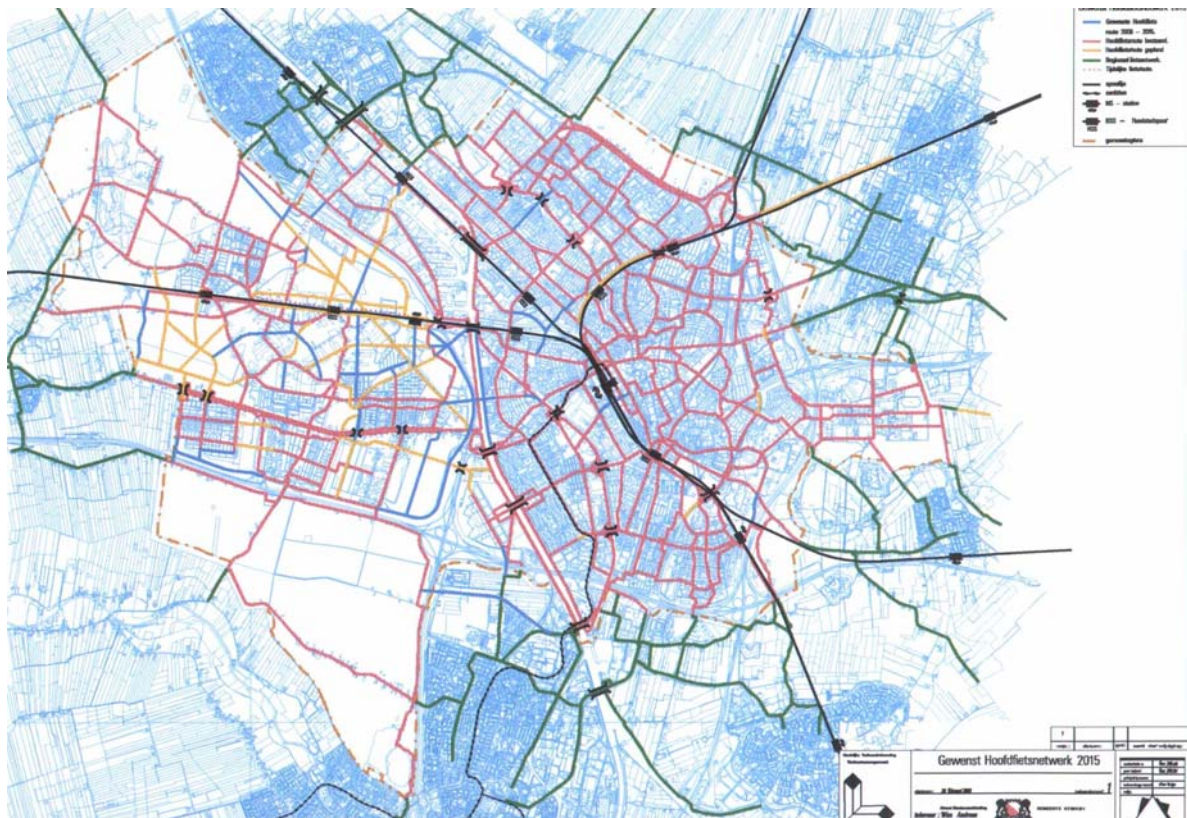
Utrecht has up to now only developed sectoral policy in the area of traffic and transport. Policy documents in the area of traffic safety, parking, bicycles, road categorisation, public transport and highway structure have been made in the last years. These documents express to a greater or lesser degree the vision of the Utrecht local authority: reducing the inconvenience of car traffic in the city, while retaining good accessibility. An integral vision that also makes the link with the long-term spatial and economic developments is still missing. This will be rectified in the Local Authority Traffic and Transport Plan that is currently being made (2003). At the same time, from 2003 there will be a monitoring programme (counting and measuring car and bicycle traffic, including intensities, speeds, journey lengths in time, and waiting times at traffic control measures). This monitoring programme will have a policy-supporting role.

6.3 How to define a network?

Utrecht has set out a main urban bicycle network with a mesh of 400 – 500 metres that connects to the regional bicycle network.

This network has somewhat the form of a spider's web, in which the radials are directed at the centre of the city. The main bicycle network consists of routes. No facilities (bicycle paths, etc.) have yet been allocated to these routes. Three basic profiles are available for these main bicycle routes: a profile with a physical separation of the bicycle facilities, a profile with a visual separation of the bicycle facilities and a mixed profile. *For more information about this subject, refer to the appendix.*

The choice of the best basic profile to use is dependent on factors such as the function of the road, the intensity of vehicle traffic and the speed of vehicle traffic.



7 Realising the objectives

7.1 Integration of focus groups

In Utrecht, various social organisations are actively involved in the bicycle policy. The most important discussion partner for the local authority is the Utrecht branch of the Dutch Cyclists' Union (*Nederlandse Fietsersbond*). This is a professional organisation that not only promotes the interests of cyclists, but also carries out research and develops and implements initiatives.

The Dutch Cyclists' Union has structural consultation meetings with the road manager about the physical condition of the bicycle network. Incidental discussions are also held with the Traffic Policy department on the further development of the bicycle policy.

For instance, Utrecht's recent (2002) bicycle policy document was drawn up in close cooperation with the Cyclists' Union. They especially made a contribution to the structure of the main bicycle network and in the determination of the bottlenecks in this network.

Not only infrastructure projects, but also policy documents have a legally arranged consultation procedure. This consultation procedure involves not only those directly involved (residents, companies, shopkeepers) but also social organisations such as the Cyclists' Union, the Dutch traffic-safety organisation and senior citizens' organisations.

The regional administration (Utrecht region) is an important consultation partner for Utrecht with respect to the bicycle policy. Every five years, the regional administration draws up a Regional Bicycle Plan. This Regional Bicycle Plan is harmonised with the local authority bicycle plan and vice versa.

The regional administration executes a subsidy scheme on behalf of the State. The State used to execute the scheme itself, but to improve the harmonisation of the bicycle plans with the local needs, in the mid nineties it was decided to decentralise.

Bicycle infrastructure projects can be financed from the subsidy scheme (maximum contribution 50%), but this scheme can also provide finance to projects in the area of bicycle promotion, education, parking, etc. (here the maximum contribution is 70%). The number of projects that can be subsidised annually is limited.

7.2 Integration of departments

Within the local authority organisation, two departments play an important role with respect to bicycle policy: the Traffic Policy department is responsible for the development of the bicycle policy and the road manager is responsible for maintaining the facilities and the physical expansion of the network.

Therefore, there is intensive contact between the two departments, whereby the traffic policy department has a directing role. The degree of direction is in part dependent on the available budgets of the road manager and financial contributions that can come from other sources.

Furthermore, there are numerous local authority departments and organisations that are responsible for the execution of parts of the bicycle policy: the Town Planning department is responsible for designing public space (spatial planning), the local authority parking department is responsible for the construction and maintenance of bicycle parking, large urban developments (such as the redesign of the area around the station, the development of new districts, etc.) have their own project organisation. The work of all of these players is guided by the bicycle policy document. Consultation with the traffic policy department happens only on a project basis.

Utrecht has three administrative layers above it: the Utrecht region, the province of Utrecht and the State.

The region is the most important discussion partner with respect to the bicycle policy. After all, it is the region that is responsible for the development of the regional (cross local authority border) bicycle network. The region is also an important partner in the financial area. The local authorities are for a large extent dependent on the region for the financing of infrastructure. There is therefore regular consultation between the local authority of Utrecht and the Utrecht region on the development of bicycle policy.

The province plays only a marginal role in bicycle policy matters. It is only involved with recreational bicycle facilities. However, the province also plays a role as the provincial road manager. There is only consultation with the province on a project basis.

Since decentralisation in the mid 'nineties, the State is no longer directly involved in bicycle policy, other than in the State documents concerning spatial planning (the layout of the Netherlands) and traffic (the national traffic and transport network). The previous directing role of the State has to a large extent been taken over by the regions.

8 Realising the objectives: infrastructure

8.1 Bicycle tracks and lanes

As explained in chapter 6.3, there are three basic road profiles available for assigning bicycle tracks and lanes to the main bicycle network: a road profile with a physical separation of the bicycle path, a road profile with a visual separation of the bicycle lane and a mixed profile. Approximately half of the total bicycle network has, or should be provided with, bicycle paths. Furthermore, approximately 10% have bicycle lanes and the rest have a mixed profile.

The network of bicycle paths along existing roads in the city is mainly complete. Investment in the bicycle network will therefore in the coming years only be partially directed at improvement of the bicycle path network. The financial resources will mainly be employed in improving bicycle routes for residential areas (with a profile for mixed traffic).

Utrecht has a number of obstacles in the form of railway yards, industrial sites and canals. Sometimes long detours must be made to by-pass these obstacles. Within the framework of urban development (for instance with housing on disused railway yards or the construction of new housing districts on the other side of a canal) occasionally a shortened route can be created. However, the majority of these missing links in the main bicycle network cannot be realised as a result of the high costs (there is always an expensive tunnel or bridge needed).



Left: an important bicycle route from the city centre to the new town Leidsche Rijn. The cyclists have mostly priority.

Right: another important bicycle route in an residential area (30 km/hour). Note the traffic calming measures.

8.2 Parking facilities

Utrecht has three types of parking facility for bicycles: bicycle clamps at the side of public roads (approximately 9000 clamps), district facilities (10 district bicycle sheds and 15 *fietstrommels* - bicycle drums (covered lockable bicycle racks)) and supervised bicycle parks (13 of which 10 are run by the local authority and three by the Dutch Railway).

In the years to come, at least one new bicycle parking facility will be created. This will be located in a newly to be constructed car park on the outskirts of the Centre.

The supervised bicycle parks around the central train station all have a shortage of capacity.

Expansion of the capacity will only be addressed when the new station is realised and the area around the station is revitalised.



The open air supervised bicycle park in the shopping district.

In older districts, where there is no room to keep bicycles in the home, there is a need for local parking facilities (both built-in and the "bicycle drums" that are located on the street). A modest expansion of these local parking facilities is planned in the coming years. This is however on condition that they can be run cost effectively. This is the cause of the "strange" situation that hiring a place in a local parking facility is more expensive than a parking permit for a car. Even so, there is enough enthusiasm for hiring places in a local parking facility.

With respect to the bicycle clamps along public streets attempts are being made to improve the quality. In the Netherlands there is now an inspection mark for bicycle clamps so that the purchaser knows the quality that is being purchased.

Utrecht has played a role in the development of good bicycle clamps. At the start of the 'nineties, the central workshop of the local authority of Utrecht developed a bicycle clamp. This clamp is not only employed in Utrecht, but also in numerous other cities.

Utrecht has also created a "test facility" to test all sorts of bicycle clamps. The administration has determined that six types of bicycle clamp may be used in Utrecht.



The test facility outside the office of the municipality of Utrecht.

8.3 Maintenance

Maintenance is extremely important for the operation of the bicycle network. A good and comfortable road surface attracts users.

In Utrecht, road maintenance plays an important role on two fronts: during asphaltting activities, as many paths as possible made of paving stones are replaced by asphalted paths. The paving stones are uncomfortable and many are written off and when the paving machine is in operation anyway it is relatively cheap to asphalt the bicycle path at the same time.

Furthermore, major overhauls (complete reconstruction of roads) are often the moment when the road can be given a new profile. This is an excellent moment to introduce bicycle tracks.

8.4 Traffic signals

The traffic control philosophy document was drafted for Utrecht in 2001. This document specifies among other things the priority of the various types of traffic at traffic control measures and the maximum waiting times.

The priority sequence is (with between brackets the maximum waiting time):

1. Tram (0 sec.)
2. Regional public transport (15 sec.)
3. Motorised traffic on urban main roads (60 sec.)
4. Bicyclists on main bicycle routes (60 sec.)
5. Local public transport (60 sec.)
6. Motorised traffic on other main roads (90 sec.)
7. Other bicyclists and pedestrians (90 sec.)
8. Motorised traffic in residential areas (120 sec.)

When replacing equipment or during the reconstruction of junctions, traffic control measures will be adjusted based on these principles, where this is technically feasible.



Cyclists have their own traffic signal.

8.5 Legal aspects

Legal traffic measures are instruments that can be used to influence traffic. The most important measures for bicyclists are the parking restrictions and the traffic priority regulations.

A parking restriction can be employed to create more room for the bicyclist. If a cross section is too narrow to provide room for all of the desired functions, the decision can be taken to prohibit car parking on one or both sides of the road, in favour of the cyclist. However, such a measure results in much resistance from residents and shopkeepers. More often than not it is impossible to implement such a measure. Sometimes the measure is necessary to create a high-quality and safe bicycle route within a profile for mixed traffic.

Priority measures in favour of the main bicycle route raise the speed on the main bicycle network and can in many cases increase safety. Where possible, priority in the main bicycle network is arranged in favour of the main bicycle route.



9 Flanking policies: promotion and traffic education

Within the context of the promotion of the bicycle policy, in 2003 two products will be developed: a bicycle map of the city of Utrecht and a bicycle website as part of www.utrecht.nl. It is the intention that these two products will be brought up to date every two to three years. However, there is currently no financial arrangement for this so that at the moment it is not certain that this will occur. Utrecht has no activities in the area of bicycle education.

10 Financing to realise objectives

The financing of bicycle provisions in Utrecht is fragmented and complex. No good impression can be given of the annual expenditure on the bicycle infrastructure.

The majority of new bicycle facilities are realised in the context of major urban developments. Examples of these are the re-layout of the area around the station (construction of the bus/ train/ tram terminal, shops, houses, offices), the construction of the new Leidsche Rijn district (30,000 new houses, 300,000 m² of office space, 280 hectare industrial site) and the realisation of a network of separate bus lanes (approximately 30 km). The bicycle facilities form an integral part of such a development and with respect to finance are normally financed as part of the project (whereby for this type of project the majority of the finance originates from selling the land).

Another important source of finance for bicycle facilities is the management and maintenance of roads and public space. Here efforts are made to combine work, in other words, if work must be carried out anyway, it is relatively cheap to realise or improve bicycle facilities.

In Utrecht there is a modest budget available for new bicycle facilities. This budget is however too low to finance major investments such as kilometre-long sections of dedicated bicycle paths, tunnels or viaducts. The Utrecht region has a subsidy scheme (up to 50% of the investment costs) to encourage local authorities to invest in bicycle facilities. This enables local authorities to make larger investments. The budget from the region is however limited so that annually only a limited number of projects can be carried out.

11 Continuity

The bicycle policy document has been shown to be the most important instrument to give substance to and implement the bicycle policy. Therefore it is important to keep the document as up to date as possible. Dependent on the spatial developments (amending the main bicycle network) and the developments in the other traffic and spatial planning policy areas, such a document must be brought up to date every five to ten years.

The Utrecht bicycle policy document (2002) has 2015 as its horizon and is expected to be updated again in 2007.

Appendix

The basic profiles

There are three basic profiles available, with a total of seven variants, for positioning the bicycle in the cross section of a road.

The choice of a basic profile can be approached from two directions.

The most obvious is the approach from the basis of vehicle traffic: the basic profile is chosen based on the function of the road and the intensity and speed of vehicle traffic. However, a reverse approach is also possible and in many cases will appear to be useable: initially the preferred basic profile to be used will be determined and then the conditions must be created, with respect to vehicle traffic, in which this profile can be used. This is an especially useable approach if it is desired that safe and comfortable bicycle routes are realised, but when it is not desired or possible to lay separate bicycle paths.

Within residential areas, traffic circulation measures will be used to realise corridors with limited traffic.

*The following three **basic profiles** are available for bicycle tracks, with in total seven **variants**.*

Basic profile 1: Physical separation

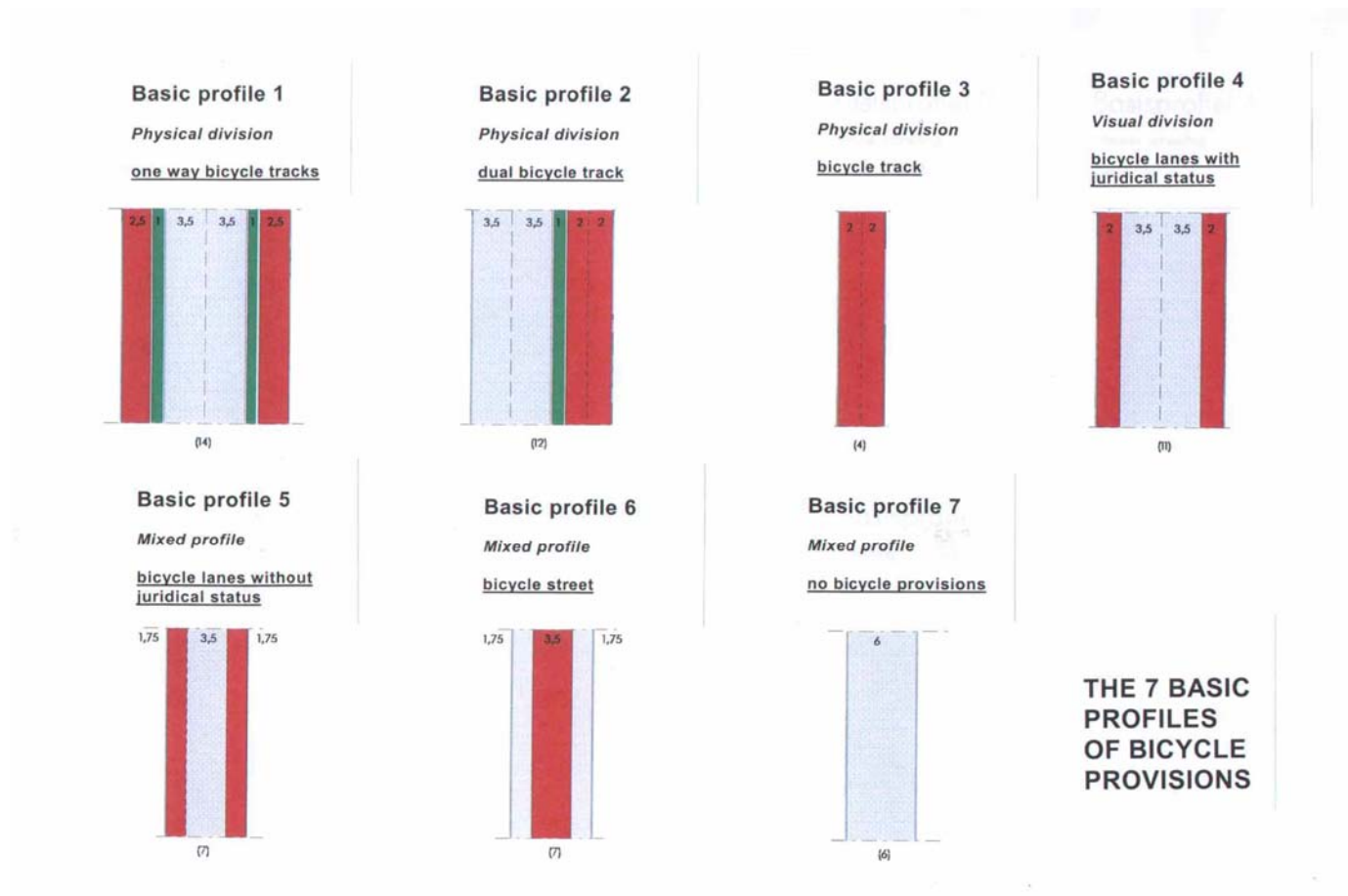
<i>Function:</i>	<i>Guarantee cyclists their own space or provide protection from the pressure of motorised traffic. Offering short connections.</i>
<i>Use:</i>	<i>By cyclists and possible moped riders. Used when car speeds and intensity are high (see graph). Furthermore, this profile is to be recommended when there is a high proportion of heavy traffic.</i>
<i>Design:</i>	<i>Separation of the cyclists from other traffic using a verge, barrier and/or height difference. If required, a separate route. Separate bicycle routes can be used to supplement the network of bicycle routes.</i>
<i>Variants:</i>	1. Separate one-way bicycle path alongside both sides of the road. 2. Separate two-way bicycle path along one or both sides of the road. 3. Solitary bicycle path.
<i>Road category:</i>	<i>Running alongside separate bus lanes. Running alongside main roads. For bicycle connections that have their own route.</i>

Basic profile 2: Visual separation

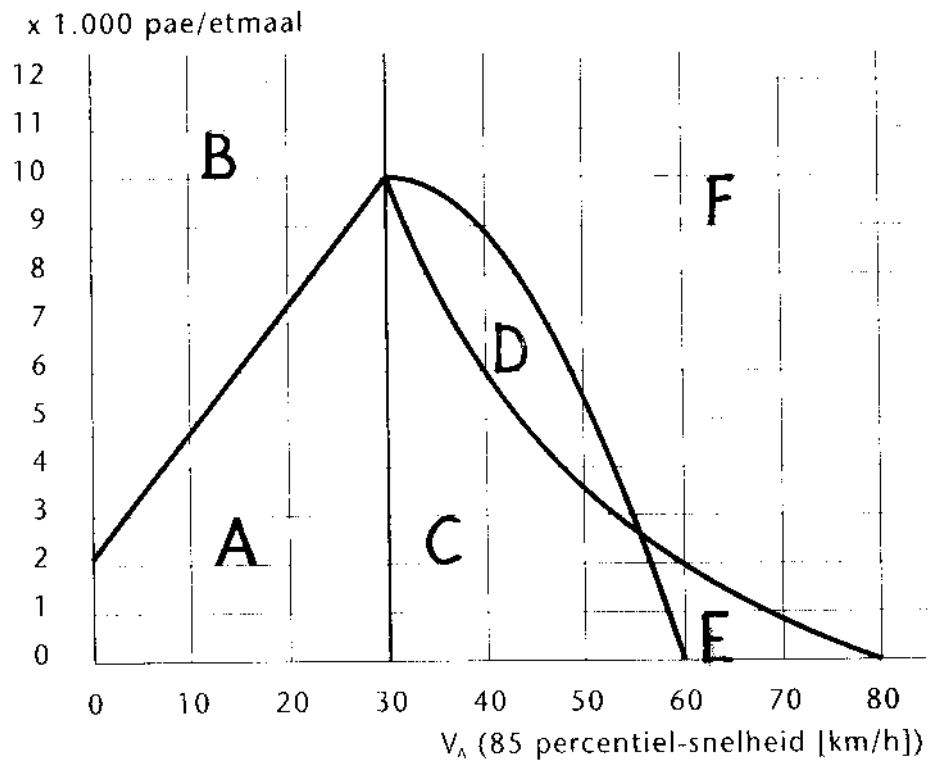
Function:	Indicate a separate space for bicyclists.
Use:	Only for cyclists. Used when vehicle speeds are between 30 and 50 km/ hour within the built-up area and 60 km/hour outside of the built-up area and in the event of high traffic intensity (see graph). Can be used to improve subjective safety. Furthermore, this profile can also fulfil a function in indicating the cohesion of the bicycle network.
Design:	Separation by a dashed or solid line. The lane must preferable be red and must always have the bicycle symbol. The bicycle lane has a legal status.
Variants:	4. Bicycle lanes in spacious profile, whereby cyclists are visually and legally separated from car traffic and can be overtaken.
Road category:	Among other things by access roads to residential districts.

Basic profile 3: Mixed profile

Function:	The offering of spacious, recognisable and comfortable bicycle routes on roads where multiple types of traffic are allowed. The handling of multiple types of traffic in the same space.
Use:	All types of traffic are mixed. Used for low speed-intensity combinations (see graph). Suitable for use in 30 km/hour zones. Outside of the built-up area maximum 60 km/hour.
Design:	Bicycle traffic and vehicle traffic are not physically separated; on a wide profile with overtaking possibilities for vehicle traffic or on a narrow profile without the possibility for vehicle traffic to overtake. By using variations in paving material, marking or the use of colour, the function as bicycle connection can be emphasised. This is the bicycle street profile. One type of layout for a profile with mixed traffic can be a single lane with bicycle lane without a legal status.
Variants:	5. Bicycle lanes without a legal status in a narrow profile, whereby the bicyclists are only visually separated from the car traffic but cannot always be overtaken. The other traffic may also make use of these lanes. 6. Roads for mixed traffic whereby, by using variations in paving, marking or colour, the presence of the cyclist is emphasised (including the bicycle street profile). 7. Roads for mixed traffic where no provisions are made to emphasise the presence of cyclists.
Road category:	In residential areas.



GRAPH: DEGREE OF SEPARATION BETWEEN CYCLISTS AND VEHICLES FOR VARIOUS SPEED-INTENSITY COMBINATIONS



Explanation of the graph:

The horizontal axis of the graph gives the actual travelling speed of the vehicle traffic, therefore not the legal maximum speed or the design speed. The vertical axis gives the car-intensities per twenty-four hours.

The graph assumes that the road does not suffer from parking problems. Parking influences the applicability of bicycle lanes.

<i>Area A</i>	<i>If V85 is lower than 30 km/hour, a mixed profile is generally recommended. Bicycle paths or bicycle lanes can also be laid for reasons of subjective safety or the continuity of the bicycle network.</i>
<i>Area B</i>	<i>Combinations of extremely low speeds and high intensity do not or hardly ever occur.</i>
<i>Area C</i>	<i>In general, a road without bicycle lanes or bicycle paths is acceptable. However, dependent on other road and traffic characteristics, they can be desirable.</i>
<i>Area D</i>	<i>A bicycle lane or bicycle path is desirable.</i>
<i>Area E</i>	<i>A bicycle path is desirable, but the intensity of vehicle traffic is so low that a road with a mixed profile is also acceptable. Bicycle lanes are not recommended.</i>
<i>Area F</i>	<i>For these high speeds and car intensities, bicycle paths are always necessary.</i>

Colophon

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