Bicycle or car?
The potential for cycling in Flanders

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Introduction

Flanders is the northern Dutch speaking part of Belgium. Although the Flanders region has a relatively high proportion of cycling 62% of all journeys are made by car, 44% as a car driver and 18% as a passenger (Zwerts & Nuyts, 2002). The car is even the main means of transportation in about 50% of the short journeys (lesser than 5 km). This high proportion of car use puts a great stress on the (built) environment. Air pollution, congestion and unsafety come with the benefits a car offers. In search of a solution for these problems the Flemish government sets durability as the starting point. The global policy is set in the Mobility plan (Ministry of the Flemish Community, 2001). Further details are elaborated in the Flemish Bicycle Plan (Ministry of the Flemish Community, 2002). An increase in the share of bicycle journeys from the current 15% to 19% is the target.

Nearly 50% of all car trips are shorter than 5 km (Zwerts & Nuyts, 2002), a distance commonly assumed bikeable. It would be (too) easy to state that therefore 50% of al car trips could easily be replaced by bicycle. The goal of this research is a more in-depth exploration of the car journeys that may be bikeable. The data from the Flemish Travel Behaviour Survey form the basis of this research. When car journeys meet a number of criteria they are supposed to be bikeable.

In the following section a short overview is given of bicycle use in Flanders, as resulted from the Flanders Travel Behaviour Survey from 2000 (Zwerts & Nuyts, 2002). Then the criteria used to estimate the potential of a modal shift from car use to bicycle use are explained into more detail. The results of this estimation follow after that. The last part is reserved for a discussion of these results and the criteria that are used to obtain them.

Bicycle use in the Flanders region

From January 2000 until January 2001 a Travel Behaviour Survey was held in the Flanders region. 7.727 households were contacted. Eventually 2.500 households agreed to participate to the survey. The survey was carried out by means of a inquiry in which

1. a questionnaire had to be filled out concerning the household;
2. a questionnaire had to be filled out for each member of the household older than 6 years. This questionnaire included a part in which each member of the household filled out his or her journeys over an assigned 2-day period.

When possible the households were contacted by telephone before the questionnaires were send to them in order to obtain a higher response rate.

14,6% of all journeys in Flanders are made by bicycle (figure 1; Zwerts & Nuyts, 2002). As in many other western countries the car is the dominant means of transportation. 61,8% of all journeys are by car. In 44,2% the journey is made as the car driver while in the remaining 17,6% the trip is made as a passenger in a car. Since these percentages take only into account the main transport mode of the trip, a slight underestimation of the shares for bicycle or pedestrian trips may exist. Travel by bicycle or by foot as part of a multimodal travel chain is not included.
Even when only short trips are considered (5 km or less) the dominant position of the car stays (figure 2). 50,2% of all short trips are made by car. The modal share of the bicycle increases to 22,7% and the pedestrian share augments to 19,1%. From a car point of view we see that a substantial part of all car trips (42%) are shorter than 5 km.

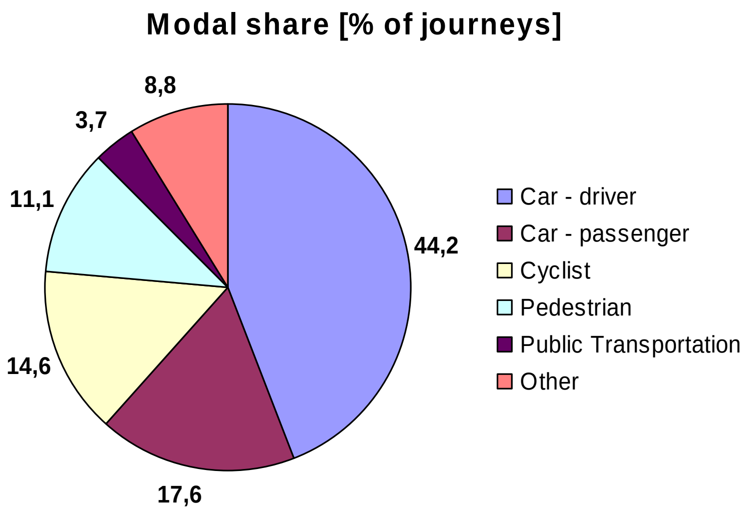

Figure 1: Modal share of journeys in the Flanders region
Source: Zwerts & Nuyts, 2002

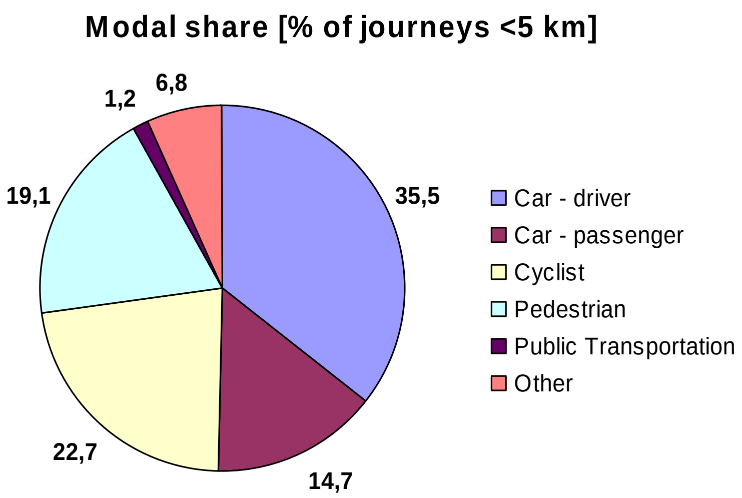

Figure 2: Modal share of short journeys (<5 km) in the Flanders region
Source: Zwerts & Nuyts, 2002

Data and methodology

Since the goal of this research was to determine the share of car trips that can be replaced by bicycle trips, a subset of the data of the Flemish Travel Behaviour Study, which is described above, is taken. The dataset used in this study consists of 11.931 car trips. For every trip it is decided if, given some selection rules, a modal shift from car to bicycle could be assumed reasonable. The selection criteria are based on a combination of data available, common sense and experience with modal use. Since some of the criteria are disputable, sensitivity analyses are performed to measure the effect of some of these criteria.

Following assumptions are made for the basic scenario.

- Trip chains are defined as a series of journeys starting at home and ending again at home. In the analysis, we assume that, if one trip within a chain is not substitutable, none of the trips of that chain is substitutable.
- We assume that cyclists strive for an equilibrium between the activity duration at a specific location and the time (and hence the distance as well as the effort needed) one is prepared to spend to reach that location. The longer the activity, the longer one is prepared to cycle to the location where the activity takes place. Moreover, if the time at the location is too short, the trip to and from that location feel like one trip instead of two separate trips. E.g., if a person cycles 2 km to the baker, buys a bread within 2 minutes, and then returns to home, this feels like one trip of 4 kilometres rather than two separate trips of 2 kilometres each. In the basic scenario we assume that:
  If time at the location is shorter than 15 minutes, both trips feel as one long trip, and one is prepared to cycle only for 3 km (around 10 minutes of cycling).
  If time at the location is between 15 and 60 minutes, both trips still feel as one longer trip, and one is prepared to cycle only for 5 km (15-20 minutes).
  If time at the location is between 1 and 4 hours, both trips feel as two separate trips. One is prepared to cycle for 5 km (one way).
  If time at the location is longer than 4 hours, both trips feel as two different trips. One is prepared to cycle for 7 km (one way).
- Not all trips for shopping can be done by bicycle. E.g. the weekly shopping trip is for many people hardly feasible by bicycle. It is assumed that 40% of the shopping trips are not substitutable because the large amount of goods to be carried along.
- Comparably, not all trips to drop off or fetch someone can be done by bicycle. One small child can easily be carried by bike, but more children or older people are difficult to drop off or fetch by bicycle. It is assumed that 50% of these 'drop off or fetch' trips are substitutable.
- It is assumed that a modal shift to bicycle cannot be expected from people older than 75.
- At night, i.e. from 20.00 to 6.00, a modal shift to bicycle cannot be expected for men older than 65 years and for women of all ages.

Although some limits may seem a little bit arbitrary, there is some support for these limits from the real modal use as recorded in the Flemish Travel Behaviour Survey (Nuyts, 2005). In the discussion we will go deeper in to this.

Since the limits that are used are all to some extent arbitrary a sensitivity analysis is performed. Therefore some of the limits used in the basic scenario are changed. The following limits are also tested:

- Different time at location in order to feel that both trips feel as one long trip, in combination with longer or smaller distances one is prepared to cycle
- Percent of substitutable shopping trips ranges from 20% to 75%.
- Percent of substitutable 'drop off or fetch' trips ranges from 25% to 75%.
- Age above which people cannot be expected to cycle ranges from 60 to 75 year.
- Night start ranges from 19.00 to 22.00.

By doing so a range of results is obtained. Apart from the basic scenario a best and worst case scenario is simulated by combining the most favourable or most adverse limit values. The results for the basic scenario as well as the worst and best case scenario are given in the next section.

Results

Results are presented in a cumulative way. E.g. in table 1 we find that if we take into account that certain combinations of distance and time at the location cannot result in a modal shift, it is found that only 25% of the car trips can be changed into bicycle trips. If we also take into account that only 50% of the trips to take away or back someone, then only 23% of the total number of car trips are substitutable.

Table 1. Percentage of car trips substitutable in the basic scenario

All car trips	100%		
Combination of distance	25%		

and time at location substitutable		100%	
Drop off / fetch OK	23%		
Shopping OK	20%	80%	100%
Younger than 75 year	19%		
Driving at night OK	**17%**		85%

In the basic scenario 17% of the car trips are eventually considered substitutable by bicycle trips. Three quarter of the car trips cannot shift to bicycle, since at least one of the trips in the chain is too long (in relation with the time at the location) to be suited for cycling. Of these trips, 20% can not be substituted since at least one trip in the chain is an irreplaceable shopping or 'drop off or fetch' trip. Of the remaining trips, 15% is not substitutable due to age or social unsafety.
Due to the uncertainty of the limits used a sensitivity analysis was performed. The age above which men don't cycle anymore at night (because they feel uncomfortable) influences the end results only to a minor extent. The percentage of substitutable car trips remains 17% if the age that men do not drive at night is changed to 60 or 70 year instead of 65 years. Changing the starting hour of the night (20.00 in the basic scenario) has some more impact. If night starts at 19.00 the number of substitutable trips decreases to 16%. Using a later hour (22.00) as the start of the night increases the number of substitutable trips to 18%.

Table 2. Percentage of substitutable trips depending on assumed percentage of substitutability of different trip purposes.

	20% shopping trips not substitutable	40% shopping trips not substitutable	60% shopping trips not substitutable
75% drop off or fetch trips not substitutable	17%	16%	15%
50% drop off or fetch trips not substitutable	18%	17% (=basic scenario)	15%
25% drop off or fetch trips not substitutable	18%	17%	16%

A change in the assumptions concerning shopping behaviour can change the percentage of substitutable trips with around 2% (table 2, compare within rows). A change in the assumptions concerning 'drop off or fetch' trips changes the percentage of substitutable trips with only 1% (table 2, compare within columns). From the data of the Flemish Travel Behaviour Survey, it is logical that the impact of shopping trips is larger than that of drop off/fetch trips. In Flanders, there are 1,6 times as many shopping trips by car than there are car trips to drop off or fetch someone (Zwerts & Nuyts, 2002).
The idea behind the effect of time at the location is twofold. Firstly, we assume that if activity duration at the destination is short, the trip to that destination and the trip from that location are felt as one single trip. In the basic scenario it is assumed that if one stays at the same location for more than one hour, the trips to and from that location feel as two different trips, even when a bicycle is used as transport mode (table 3). When the activity duration is shorter than one hour however, both trips are considered to be part of one and the same trip.
Secondly, we assume that the shorter the time spent at the location, the less far we are willing to drive as to balance its duration and the time (and effort) needed to get there. For times at the location shorter than 15 minutes, we assume that people only want to cycle for three km (hence the distance home-location can only be 1,5 km). If one remains at the location more than 4 hours, people might be willing to cycle for 7 km. In all other situations, the maximal distance for a modal shift is 5 km for a trip.

Table 3. Assumptions (basic scenario) concerning substitutable distances in combination with time at the location

Time at location in minutes	$0 < t \leq 15$	$15 < t \leq 60$	$60 < t \leq 240$	$240 < t$
Trip to and from location feel	one single trip	one single trip	two different trips	two different

as				trips
Maximal distance for modal shift to bike	3 km	5 km	5km	7 km

In order to estimate the effect of these assumptions on the percentage of possible modal shift, several other scenarios are also tested. Table 4 shows the results following the different assumptions made in the different scenarios.

Table 4. Percentage of substitutable distances with different combinations of distances and times at the location

Trip to and from location feel as	*one single trip*	*one single trip*	*two different trips*	*two different trips*	*Percentage substitutable*
Basic scenario	$0 < t \le 15$	$15 < t \le 60$	$60 < t \le 240$	$240 < t$	17%
	3 km	5 km	5km	7 km	
Changing distance					
Scenario 2	$0 < t \le 15$	$15 < t \le 60$	$60 < t \le 240$	$240 < t$	14%
	3 km	5 km	5km	**5 km**	
Scenario 3	$0 < t \le 15$	$15 < t \le 60$	$60 < t \le 240$	$240 < t$	15%
	5 km	**5 km**	**5km**	**5 km**	
Scenario 4	$0 < t \le 15$	$15 < t \le 60$	$60 < t \le 240$	$240 < t$	18%
	5 km	5 km	5km	7 km	
Changing times at the location					
Scenario 5	$\boldsymbol{0 < t \le 30}$	$\boldsymbol{30 < t \le 60}$	$60 < t \le 240$	$240 < t$	17%
	3 km	5 km	5km	7 km	
Scenario 6	$0 < t \le 15$	$\boldsymbol{15 < t \le 120}$	$\boldsymbol{120 < t \le 240}$	$240 < t$	16%
	3 km	5 km	5km	7 km	
Scenario 7	$0 < t \le 15$	$\boldsymbol{15 < t \le 30}$	$\boldsymbol{30 < t \le 240}$	$240 < t$	19%
	3 km	5 km	5km	7 km	
One single change in behaviour after half an hour					
Scenario 8		$\boldsymbol{0 < t \le 30}$	$\boldsymbol{30 < t}$		17%
		5 km	**5km**		

In the basic scenario is assumed that people can be expected to cycle trips up to 7 km. If we decrease this distance to 5 km, the percentage of substitutable trips decreases to 14% (scenario 2). Other changes in the basic scenario have less impact (scenarios 3 and 4).
Realistic changes in the limits set for the times at the location have an impact up to 2% of the percentage substitutable trips (scenario's 5 , 6 and 7).
A more simple scenario that results in a comparable effect as the basic scenario assumes that people are willing to cycle for 5 km, but that for a time at the location shorter than half an hour, the trips to and from the location are felt as one single trip, while they are felt as separate trips for longer activity durations. It is striking that in simulations using an independent dataset collected in an identical way as the Flemish dataset (Travel Behaviour Survey of Ghent) the possible modal shift of the basic scenario and of the simple scenario 8 are also very close to one another (18.50% versus 18.37%).
Finally, we composed the worst and best case scenario based on the separate building blocks described above. The description of the scenarios and the results are given in table 5.

Table 5. Percentage of substitutable car trips in the basic scenario, the worst case and best case scenario.

	Basic scenario	**Worst case**	**Best case**
Age men are 'old' =	65 year	60 year	70 year
Night starts at	20.00 hour	19.00 hour	22.00 hour
Time 1 at location=	15 min	30 min	15 min

Distance 1 =	3 km	3 km	5 km
Time 2 at location =	60 min	60 min	60 min
Distance 2 =	5 km	5 km	5 km
Time 3 at location =	240 min	240 min	240 min
Distance 3 =	7 km	5 km	7 km
% take away/back trips not substitutable	50 %	75 %	25 %
% shopping trips not substitutable =	40 %	60 %	20 %
	Basic scenario	**Worst case**	**Best case**
All car trips	100%	100%	100%
Combination of distance and time at location	25%	20%	26%
Bring/fetch OK	23%	19%	25%
shopping OK	20%	15%	23%
Younger than 75 year	19%	15%	22%
Cycling at night OK	**17%**	**12%**	**21%**

Taking only variables into account that are available in the dataset of the Flemish Travel Behaviour Survey, we conclude that in the worst case scenario 12% of all car trips are substitutable. In the best case scenario, a little bit more than one fifth (21%) of all car trips are substitutable.

42% of all car trips are shorter than 5 km, a distance that is considered suitable for cycling by almost everybody. A similar calculation is done in which the dataset of car trips is restricted to those car trips that are shorter than 5 km. In this study we find that only 31% (within an interval of 25-40%) of these short car trips are considered bikeable.

Since only short car trips are replaceable by bicycle the decrease of car kilometers is less pronounced. The total distance travelled by cars decreases with 4% (2-4%). The decrease is far more pronounced for short trips. The total amount of distance travelled by car for these short journeys decreases (often in urban areas) with 30% (24-37%).

Discussion

As we have established, 17% of all car trips could be replaced by bicycle journeys. In that case the modal share of the bicycle augments from 15% to 25% while the modal share of the car decreases from 62% to 51% of all trips. In the worst case scenario (12% of all car trips are substitutable) the modal share of the bicycle grows to 22% of all trips. In the best case scenario (21% of all car trips are substitutable) the bicycle is good for a share of 28% of all trips. These values are all well above the target of 19% set by the Flemish government. For short trips the share of the bicycle will increase from 22.7% to 38% (35%-43%).

In the Netherlands the modal share of the bicycle is currently around 25% (AVV, 2005). Even then a significant share of the car trips could be done by bicycle. According to an older study (MVW, 1998 referring to an older study from ITS (1992)) 25% of all car trips in the Netherlands could be easily done by bicycle and another 25% with some effort, even when the use of the bicycle is already high. This must encourage the Flemish authorities in reaching their goal since the potential might reach far beyond the calculated potential.

Spatial planning is however quite different in Flanders and the Netherlands. A consequence of this planning differences is the mean distance of the journeys, which is lower in the Netherlands (around 10.5 km versus 12.5 km in Flanders). Since travel distance is the main determinant of cycling it is clear that the potential for cycling is higher in the Netherlands than it is in the Flanders region. But still then the growth potential in Flanders should be quite substantial.

James et al (1999) calculated the potential for cycling in Perth (Australia). They found that 29% of all motorised private mode trips are in principle replaceable by bicycle (car trips with no constraints (e.g. <6 km), bicycle available). In 20% of those potential bicycle trips the amount of time was the reason for non-cycling. Negative judgement (lack of bicycle infrastructure, comfort and community climate) was decisive in 65% of the trips. For 15% of the potential bicycle trips people just didn’t think about the bicycle as an alternative for the car.

The potential as calculated starts from a number of assumptions. These assumptions are, when possible, founded on the data of the Travel Survey and therefore on the current travel practice in Flanders. The assumptions can be subdivided in 3 categories: a distance criterion, a motive criterion and a social safety criterion. The distance criterion has the largest impact on the substitutability of car trips. When journeys are too long they are no longer feasible by bicycle.
Table 6 contains the percentages of cycling trips that are shorter than the distance given. Recreational cycling is hereby excluded. We see that 70% of all bicycle trips are shorter than 3 km, 85% shorter than 5 km and over 90% shorter than 7 km. The modal share of the bicycle is the highest in the distance range of 0.3-3 km with a share between 20 and 30% bicycle trips (Zwerts & Nuyts, 2002). By choosing the limits on 3, 5 and 7 km respectively we set a realistic target. However 5% of bicycle trips are longer than 10 km. Furthermore recreational cycling and bicycle racing are very popular in the Flanders region. During these trips large distances are covered sometimes (exceeding 100 km). When these people realise they can cycle for non-recreational purposes too, there might be a significant potential for substitution of longer car trips during every day travel. Since the goal of the study was to examine the potential of substitution of car trips by bicycle, we aimed for those people who don't cycle today. Therefore we decided to base the limits on the current bicycle use. Higher limits will increase the cycling potential, lower limits will in turn decrease the potential for cycling. We found no scientific research on the relation of activity duration and travel distance (or time) by bicycle that could underpin scientifically the assumptions of this paper. A sensitivity analysis was performed in order to meet the uncertainty.

Table 6. Percentage of cycling trips in relation to trip distance (Nuyts, 2005).

Cumulative percentage	Distance [km]
10%	0.5
30%	1
70%	3
75%	3.5
80%	4
85%	5
90%	6.5
92%	7
95%	10
100%	77

Two travel motives that involve the transportation of persons or goods are considered: trips which involve dropping off passengers or returning them home (car is used as a taxi) on the one hand and shopping trips on the other hand. Some of the taxi trips involve persons that are too young, too old or not able too cycle. Since we have no data in deciding for which 'taxi' trips the bicycle is a possible alternative we decided to flip a coin: 50% of these trips are assumed substitutable. The substitutable trips are hereby chosen randomly.
The Travel Survey shows that every Fleming makes 2.4 shopping trips each week. We assume one of these journeys involves the weekly shopping trip to the supermarket. This trip involves often a large amount of goods which are difficult (but not always impossible) to transport by bicycle. The other shopping trips involve smaller amounts of goods and can therefore be done by bike. Hence we find a percentage of 40% (1/2.4) shopping trips that are hard to change. The trips that can be substituted are chosen randomly as was the case for the 'taxi' trips. Again the uncertainty that comes with both assumptions is met by a sensitivity analysis.

The last group of assumptions involve concerns about social safety and personal factors. One cannot expect people to cycle when they don't feel safe. Nor can we expect older people that don't cycle already to take up cycling. There might however be some older people that are still capable of cycling but choose not to. On the other hand some younger people might not be able to cycle because of medical reasons. From the data from the Travel Survey (Zwerts & Nuyts, 2002) we find an upper limit for age of 75-80 years. We assume therefore that people older than 75 year that don't cycle already

shouldn't be expected to take up cycling. Increasing the upper limit to 80 years wouldn't make a great difference in view of the relatively small number of trips by older people.
Several people don't like riding at night for reasons of (perceived) social unsafety. From the Travel Survey we find no clear indication of the time after which people of different age groups do not cycle anymore. Therefore we define the beginning of the night as the time on which on average the night falls (it's getting dark), hence 20.00. We assume for the basic scenario that women of all ages and men above 65 year can't be expected to cycle when they don't cycle already. The uncertainty incorporated in these criteria will also be met by the sensitivity analysis.

The hypotheses used in the calculation are all based on the data available in the Travel Survey. There are however other parameters that influence bicycle use. Several papers give a review of factors that influence bicycle use and bicycle route choice (Hunt & Abraham, 2001; Rietveld & Daniels, 2004; Nasser, 2004; Goetzke & Rave, n.d.). Besides physical aspects such as hilliness and city size and features of the population (share of youngsters, students), policy efforts such as building high quality bicycle infrastructure, eliminating hindrances, improving traffic safety and reducing the dominant position of the car also matter. Additional aspects they mention are climate (people usually don't like cycling in wet and cold conditions) and inconveniences like getting sweaty. Finally cultural aspects (biking culture), attitudes and habits influence bicycle use. Furthermore the different aspects seem to have a different impact on different types of cyclists.
Adverse weather conditions keep numerous people from cycling. Many inhabitants see Belgium as a wet and cold country. It has been shown however that it only rains about 6-7% of the time. And extreme temperatures are rare as well. Related to weather conditions is air quality. In summer and winter smog conditions physical activities such as cycling are discouraged. Besides the obvious paradox of more polluting transport when pollution is high these weather and pollution conditions might influence bicycle use adversely.
Flanders is a relatively flat region. Long and steep slopes are rare. And where hills do occur a relatively flat alternative route is often available. The relief shouldn't therefore be much of a problem in most parts of Flanders.
Probably more important is the (perceived) lack of safe and comfortable bicycle facilities, both alongside the travel routes and at the destination (e.g. shower facilities). This lack of infrastructure induces an extra resistance for many to cycling especially for less experienced cyclists. In the Flemisch Cycling Plan (Ministry of the Flemish Community, 2002) an improved traffic safety is set as a primary condition for an increased bicycle use.
None of these conditions were included in the analysis because the data are either incompatible with the data from the Travel Behaviour Survey or not available at all. Nevertheless these parameters may prove to be important obstacles in achieving the goals set by the policy makers and in attaining the full potential as calculated.

Since the study is based on the Travel Survey of 2000 it calculates the potential for cycling within this given travel pattern. Origin and destination of journeys and hence the distance are given. Only modal choice is set as a variable. Mobility is however a complex system of which travel patterns are only one level.
The number of journeys increases e.g. with increasing population density (Nuyts & Zwerts, 2004). The total distance of these journeys remains however constant irrespective of the population density. This means that the average trip length will be shorter in an urban environment. This explains the higher share of bicycle trips in more densely populated areas and the differences in modal shift in general. When population density becomes to high the share of bicycle trips no longer increases. The bicycle journeys may in that case be replaced by walking trips. This means that spatial planning can and will have quite an impact on modal choice.
Travel patterns (modal choice, distance, trip number) change not only as a consequence of changing spatial structures. Demographic factors play an important role too. Travel patterns differ e.g. according age and gender, work situation, … Bicycle use is highest for the age category of 13-15 (Zwerts & Nuyts, 2002). 40% of all their journeys are made by bicycle. In the age group of 25-34 bicycle use drops to a low of 9%. Education level influences bicycle use too. In general we find a declining bicycle use when the education level rises (as travelled distances grow). Furthermore different age groups have different motives for their journeys. Young people make the most journeys in order to go to school, middle-aged people go to work the most and older people make the most journeys for shopping. As these facilities are situated on different locations the travel patterns of different age groups will differ. When the demographics of a region change a different travel pattern will therefore follow.

Lastly investments in transportation infrastructure can also change the modal choice. Building more and better cycling infrastructure can decrease the resistance to cycling, more busses that ride more frequent can increase the number of people that use public transportation. Creating more parking facilities can make car driving even more attractive.
The government can influence travel patterns in many different ways, willingly or accidentally. Doing so the potential for cycling can increase or decrease wether travel patterns evolve towards longer or shorter trips. The travel pattern is certainly not a constant. In this analysis however a certain distribution of travel distances is assumed. When this distribution changes over time (towards longer distances or rather to shorter distances) the calculated potential for bicycle use might decrease or increase accordingly.

From an environmental point of view the decrease in the total distance covered by (motorised) vehicles is of importance. Since only short car trips are replaceable by bicycle the decrease of car kilometres is less pronounced. The total distance travelled by cars decreases with 4% (2-4%). The decrease is far more pronounced for short trips. The car kilometres for these short journeys decreases (often in urban areas) with 30% (24-37%).
In the Flanders region cars are, every year, good for 36 billion kilometres. A 4% reduction is therefore good for a total reduction in CO_2-emissions of 0.26 million tons (an average car emits about 180 g CO_2 per km driven). In 2000 the total CO_2-emissions due to transport are estimated on 14.5 million ton (this amount is higher than we would calculate based on the travel data from the Travel Behaviour Survey because it also contains freight transport and foreign drivers use Flemish roads too). An increased use of the bicycle (4% of all car kilometres by bicycle) can reduce this total emissions due to transportation by 1.8%. Since cars are getting cleaner this share will probably decrease over time. However up till now the growth of the vehicle performance (the total amount of kilometres driven) and the tendency towards larger cars (over)compensates the better environmental results of modern cars.

Conclusion

17% of all car trips in the Flanders region can be replaced by bicycle trips. This would induce a growth in the modal share of the bicycle from the current 15% to 25%, the present percentage bicycle trips in the Netherlands. This 17% may seem low since almost half of all car trips are shorter then 5 km. Besides distance other factors play a role too. Many of these short car trips are part of a chain of trips, passengers or produce can be difficult to transport by bicycle, or people find it unsafe to cycle.
The potential that is calculated shouldn't be looked upon as the absolute maximum achievable. The calculations are based on the existing travel patterns from 2000. Circumstances that influence these travel patterns can (and will) change overtime. Population characteristics change over time (more elderly and less young people), spatial developments will have an important impact on travel distances. Furthermore several variables that most definitely influence bicycle use (such as weather conditions and hilliness) aren't taken into account. Finally the calculations involve a number of criteria of which the limits can change.
The existence of an important potential for cycling doesn't mean that the target that is set (19% of all trips should be bicycle in 2010) will be met without any effort. It just means that there is a good chance of meeting the target. In order to do so people will have to be convinced to choose for the bicycle for those trips that can be done by bicycle.

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