Planning for cycling and walking as a catalyst for a successful road safety policy for all users

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Safety and mobility of cycling are strongly related to each other. Cities and countries that show an increase in the level of cycling, also show a decrease in accidents with fatal or serious injuries. Partly this is a result of more presence of cyclists on the road, which increases expectations and anticipation by other road users. However, more safety can be gained by planning facilities for cycling.

Contrary to the prospect that more cycling will result in more traffic deaths, the perspective is that road safety will increase as a result of bicycle planning. Measures to restore the balance between the interest of motorised and non-motorised traffic do not only improve the safety of cycling and walking, but also the safety of motorised modes. An integrated planning for different modes fits perfectly well with modern road safety policies that focus on the prevention of risk. Proper planning for cycling and walking is a catalyst for road safety.

1. More cycling mobility, more cycling safety

More cycling mobility goes together with a lower risk to being killed per km cycling. The risk of being killed per km of cycling per country is inversely proportional to the level of bicycle use, according to a comparison in the WALCYNG-study between Great Britain, Italy, Austria, Norway, Switzerland, Finland, Germany, Sweden, Denmark and the Netherlands[i]. Table 1 illustrates this. One of the reasons for this is that "Rare events are dangerous".
Figure 1 confirms this relation. The number of bicycle km per person per day in 47 Danish towns is compared with the number of injured cyclists per million-bicycle km travelled[ii].

Data from different countries show that an increase in cycling use and an increase in the safety of cycling also go together very well. For example, the final report of the Dutch Masterplan Bike[iii] concludes that in 1998 the number of fatalities among cyclists was 54 per cent lower than in 1980 in spite of the increase in both car use and bicycle use. The increase of car kilometres was about 50 per cent and the increase of cycling kilometres was about 30 per cent. The share of cycling of all trips is 28 per cent and scarcely changed over the period.
In Germany the total number of cyclist fatalities fell by 66 per cent between 1975 and 1998 while the share of cycling in transport increased substantially from about 8 per cent to 12 per cent of all trips[iv].
In the city of York in the UK 15 cyclists were killed or seriously injured from 1996 - 1998 compared to 38 in 1991 – 1993, while cycling level rose from 15 to 18 per cent[v].

How can we explain this positive trend in cycling fatalities while the risk of being killed on a bicycle is higher than in a car, as road safety statistics show? Is there a general road safety trend that results in less cyclists being killed and what has more cycling to do with this positive road safety development? For a better understanding, we have to go back to the period of a high growth of motorisation at the expense of cycling use.

2. Control of Car Traffic

2.1. A reconsideration of motorisation

All over the world a rapid growth in motorisation has lead to planning policies that make cycling and walking more difficult and unattractive. This has continued to the point where motorisation asks too much from society. In Western Europe the trend to give full priority to cars started in the 1950's and changed in the early 1970's. In the seventies the consequences of growing car use for city planning and the huge costs required to invest in all the facilities that cars would need became obvious for the first time. In 1972 it was estimated in the Netherlands that 15 – 22 billion Dutch florins (7 – 10 billion EURO) would be needed till 2000 to make room for the ongoing growth of motorisation. This

calculation had a disastrous political impact as these consequences were political unacceptable[vi]. In the 1960's city planners were still prepared to fill in historic canals and to build broad corridors and ring roads in inner cities[vii]. Most of the plans could be prevented in the 1970's and indeed much restructuring of inner cities to make more room for car traffic is regretted now. The start of a policy to control car growth was strengthened by the first oil crises and the first report by the "Club of Rome" warning us about the limits of the supply of natural resources and the consequences of our growing wealth for the environment.

In the 1960's there was no planning for cycling. On the contrary, the prospect of planners was that cyclists would disappear in the next decades including the Netherlands. The OECD report on vulnerable road users presents a clear statement on the traffic policy in motorised countries in this period: "From the 1960s roads were built to accommodate growing car traffic with often disastrous effects to vulnerable road users and residents of built-up areas. Moreover, the expansion of urban areas led to increasing travel distances from home to work, disqualifying walking and cycling as means of performing a large part of everyday trips."[viii]

2.2. *Road safety in relation to motorisation*

What happened to road safety and cycling use in the Netherlands before and after the reconsideration of motorisation?

- The use of the bicycle reached its highest level in 1960. The amount of cycling kilometres dropped from this year by almost 40 per cent until 1977. Nevertheless, the number of cyclists being killed per year sharply increased from 1960 on in line with the overall road safety trend. The yearly total of people killed in traffic reached its peak in 1972, when it was three times more than in 1950.
- From 1972 that marks the start of the reconsideration of motorisation, the total of road fatalities started to decrease and in 2002 the total of fatal injuries in traffic is almost the same as in 1950. Cycling shared in this success story and continued to do this after 1977 when the number of cycling km per year rose from less than 10 billion km to 13.5 billion km.

Figure 2 and 3 present the development of cyclists respectively all road users being killed per year in the Netherlands. Figure 4 presents the trend in the use of different modes of transport.
In 1976 the Dutch government introduced two sources to support local cycling policies. One arrangement offered a subsidy of 80 per cent of the costs for urban cycling facilities; the other one offered a subsidy of 50 per cent of the costs for cycling facilities along minor (secondary and tertiary) rural roads. Between 1978 and 1988 the length of cycle tracks increased by 73 per cent to 16.100 kilometres, while the total length of all roads increased by 11 per cent to 101.000 kilometre and the length of freeways by 19 per cent to 2100 kilometre[ix]. From 1990 to 1997 the Dutch Bicycle Master Plan was executed, to promote the use of the bicycle and at the same time increase its safety and attractiveness.
However, the positive trend for safe cycling had already started before measures for cycling provisions were taken.

2.3. Explanations

The main conclusion is that the single focus on motorisation correlates with an increase in road safety fatalities, whereas control of the growth of car use correlates with a decrease in road safety fatalities. There are two explanations for this:

1. Road safety scientists emphasise that the risk of being killed per kilometre decreases steadily. This is a result of measures being taken, more experience in policy development and also more experience by the road users. As long as motorisation grows rapidly, the absolute numbers of fatally injured road users may still increase. A lower risk cannot compensate for the growth in motorised traffic. But as soon as the growth of car use is reduced, the traffic system (i.e. road users, policy makers and designers) manages to decrease the total amount of road fatalities.

2. Transport and traffic policy changed radically in the early 1970's. Control of car use and promotion of public transport reached the national political agenda. Walking and cycling were subsequently valued more positively, car drivers have had to adapt their behaviour in residential areas and traffic calming has spread. The planning and designs of the roads changed to an

orientation towards a mix of traffic modes. Policy started to include different modes of transport, motorised and non-motorised, in the planning system. It was not then very balanced, but at least the sole focus on the needs of cars disappeared.

The second explanation is not contradictory to the first but an addition that in general is being overlooked by the road safety sector. Road safety experts show that the risk of being killed per kilometre cycling is several times higher than for car drivers. They are right to a much smaller extent than they say. Their calculations are not at all sophisticated because they compare all km by cars with all km on bicycles, while they have to focus on the short car trips that can be replaced by the bicycle and they have to include the risk exposed to other road users. Table 2 shows how this method results in a risk comparison for the Netherlands. Interesting is also to see the segmentation by age. We have to take into account that in other countries the risk of cycling will be higher than in the Netherlands. In general, the road safety experts are right in saying that the risk of being killed on the bicycle is higher than in the car although the differences are much smaller when the calculations will be more precise.

But still a change from car driving to cycling may lead to fewer cyclists being killed, as the data in the first paragraph show. This has to do with overall road safety developments and these developments can not be isolated from another way of planning that integrates the needs of pedestrians and cyclists in traffic and transport. This other way of planning can only be developed as a consequence of a policy to promote cycling and walking. The promotion of cycling and walking may therefore be an important condition to improve road safety.

3. Balancing the needs of motorised traffic and non-motorised traffic

In the past traffic and transport policies have put most of the burden of avoiding serious accidents between motorised and non-motorised traffic on cyclists and pedestrians. Nowadays two approaches regarding the safety of cycling can be distinguished. One is to combine the promotion of cycling use with specific safety measures for cycling. These measures may still to a great extent make cyclists responsible for their own safety. Bicycle helmets are an example of this approach. But road safety problems of cyclists and also road safety problems in general have to do with the risk exposed by motorised traffic. The second approach is to control motorised traffic and to let it flow on a selected number of routes and restrict its behaviour on roads with a shared use of motorised and non-motorised modes.

In order to find a better balance between the interests of non-motorised and motorised traffic the European Union commissioned a study to develop non-restrictive road safety measures for vulnerable road users. The aim was to study the impact of measures that promote the safety and mobility of vulnerable road users together and to recommend a package of road safety measures with priority on these non-restrictive measures. The research was co-ordinated by the Dutch Road Safety Research Institute SWOV and the study was called PROMISING.[x]

The findings of PROMISING are based on two approaches:
1. New visions on road safety, to create conditions for prevention of serious risk
2. Analysis of the special needs of different modes of transport for mobility and safety.

3.1. New visions on road safety

New visions on road safety are for example the Dutch concept of Sustainable Safe Traffic and the Swedish 'Zero Vision" concept. Both concepts compose far-reaching targets while both countries already belong to the top five of countries with the highest road safety standards on earth in relation to traffic exposure. The long-term goal of Vision Zero is a situation with no fatalities and no-one seriously injured in road traffic.

The concepts make tangible progress through their prevention approach compared to the curative approach that is based on accident analysis. Prevention of accidents is possible by a focus on the cause of safety problems. In both concepts a key element is to design a road structure that is adapted to the limitations of human capacity. Streets and roads have a specific function and the design of the

roads is adapted to this function so that improper use is prevented. The new road safety concepts distinguish three road categories according to their function to let traffic *flow* or *distribute* or to find *access* to destinations. Desirable behaviour will be evoked by a design in which potential conflicts fall within the expectations of the users. The design makes clear what behaviour is appropriate, which results in predictable behaviour. Speed and observation opportunities are the two key elements to keep behaviour under control.

Recommendations have been formulated about the planning and design of the road network. They explain for example how the features of the road categories for cars and those for cycling interact. The working group that formulated these recommendations in the Netherlands was composed of representatives from the central and local governments, user organisations like the cyclist union Fietsersbond and experts from agencies and research institutes. This is a standard procedure in the Netherlands for developing criteria and guidelines for the road network, co-ordinated by the organisation CROW, that for example published the manual Sign Up for the Bike[xi] and a manual on Bicycle Parking[xii]. The expertise within governments, user groups and expertise centres complement each other. The working group may go in-depth to clarify requirements and to find solutions for different kind of problems. The result is a rather high level of acceptance of the results and commitment to implementation.

3.2. Integrated network of routes for pedestrians and cyclists

The focus on the needs of pedestrians and cyclists leads to the provision of an integrated network for direct connections. Both modes need their own network, given the fact that the great majority of walking trips is less than 1 km (or at least less than 2 km) while the range of cycling for most of daily trips is easily 4 times as high as for walking (see table 3).

Five criteria are the main requirements for bikeway design[xiii]. These requirements aim to offer cyclists the best possible facilities:

- Coherence (the cycling-infrastructure forms a coherent unit and links with all departure points and destinations of cyclists);
- Directness (the cycling-infrastructure continually offers the cyclist as direct a route as possible (so detours are kept to a minimum).
- Attractiveness (the cycling-infrastructure is designed and fitted in the surroundings in such a way that cycling is attractive);
- Safety (the cycling-infrastructure guarantees the road safety of cyclists and other road-users);
- Comfort (the cycling-infrastructure provides a smooth surface, allows manoeuvrability and limits the need to come to a standstill);

These criteria can be implemented in relation to the local situation. A perfect situation does not exist; the process of making cycling efficient, safe and attractive will be of a long-term nature. But the five criteria are the best guidelines for planning and design, at strategic, tactical and operational levels.

Parts of the cycling network may correspond with the main routes for cars but overlap is minor. Different networks for different modes of transport have their own requirements. The best solutions for the different modes have to be combined with appropriate compromises for planning and design.

The PROMISING report regarding cycling presents a safe non-restrictive pedestrian and cycle network as well as principles and measures for regulations, vehicle requirements and education. Many measures are presented to illustrate the approach.[xiv].

3.3. Recommendations for a safe design of roads

In the framework of the Dutch Sustainable Road Safety System recommendations have been developed for a safe design of the road network, according to the three functional categories for flow traffic, the distribution of traffic and the access of destinations. The different demands of different modes of transport have been integrated. This is illustrated here first for urban roads (considering the network for cars respectively for cycling, and solutions for crossings) and then for rural roads.

The road network for cars

- Roads with a *flow function* for cars need to accommodate a relatively high speed. To prevent accidents while allowing for high speed, predictable behaviour is very much required. Because of the vulnerability of cyclists and pedestrians in relation to speeding, motorised traffic should be completely segregated from non-motorised traffic. Of course, these roads are not present in urban areas.
- In areas where people live or for other reasons stay for longer, only roads with an *access function* for cars can be tolerated. The vast majority of urban roads in the Netherlands are going to be designed for only that purpose and have a speed limit of 30-km per hour. Urban areas are designed in a very varied way. To ensure safety, streets must be designed in a way to focus attention on the surroundings in order to take care of other road users and search for destinations. What must be removed is every design detail that caters for a flow function for traffic.
- Roads with a *distribution function* mark the transition between the two other categories. A limited number of these roads should free most of the urban areas from through traffic. These roads will have a speed limit of 50 km per hour (or, very few, 70 km per hour).

There are different methods of concentrating motorised traffic in built-up areas on a small number of roads. Figure 6 compares three methods of distributing traffic. The first, the grid structure, has no aim to concentrate and has the worst record on road safety. The second, the organic structure, contains culs de sac. It is the best for road safety, but not a good compromise with accessibility; it provokes more kilometres of travel. The third, the mixed structure, combines safety and accessibility very well. A division of the whole urban area in such sectors that prevent through traffic strengthens the concentration of car traffic on roads with a distribution function. This supports road safety. By allowing cyclists to traverse the sector boundaries, the competitiveness of cycling compared to car driving is increased, which leads to a perfect combination of promoting cycling mobility and road safety.

The road network for cycling

The network of main routes for cycling may traverse residential areas and other parts may be situated alongside roads, which have a connection function for cars, where segregated bicycle tracks or lanes are provided. Bicycle tracks will have a width of between 2 and 2.5 metres. Lanes are permitted when car volumes are below 6000 vehicles per day. Lanes will have a minimum width of 1.50 metres. At every crossing the right of way is arranged by signs and markings. Cyclists on segregated tracks share the right of way with cars.

The speed limits in residential areas allow cyclists to mix with cars, sharing the same space. In general there are no arrangements on right of way, meaning that traffic coming from the right, has the right of way. However cyclists on main cycling routes receive right of way over all crossing traffic. Figure 7 shows a crossing between solitary cycle main route and another road in a residential area

Crossings

Cyclists and pedestrians can cross roads with a connection function for cars only at a limited number of locations. Crossing cyclists and pedestrians are provided with a refuge in the middle of the road. Where long detours may occur, bicycle tracks may allow use in both directions.
At crossings between roads with a connection function for cars, two options are available for safety: traffic lights and roundabouts of which roundabouts are safer. The recommendation is to provide for segregated bicycle tracks: the cyclists who continue to ride on the roundabout have right of way over cars leaving the roundabout.
On roads with an access function for cars it must be possible to cross everywhere. At certain places crossing might be facilitated by, for example, a raised crossing, in order to help vulnerable groups such as children, elderly and handicapped people.

Outside urban areas

Outside urban areas, main cycling routes will be sparser than inside urban areas. Cycling routes alongside roads with a flow function for cars will not exist and cycling routes alongside roads with a connection function for cars will be segregated from motorised traffic. On rural roads that have an access function for cars, in general the different modes will share the road, but in cases of relatively

high car volumes or roads that have a flow function for cycling, segregated cycling tracks or cycle lanes will be provided.
Crossings with roads that have a flow function for cars will be grade-separated. At crossings of routes with an access or connection function, measures will be taken to limit speed, whilst crossings of roads with a distribution function for cars might be at different level or provided with traffic lights. Where roads with an access function cross the right of way will be arranged according to the location and a crossing between a road with an access function for cars and a main cycling routes, the cycling routes may have right of way[xv].

3.4. Examples of design that integrate the needs of cyclists

Three examples may illustrate how an alternative design of infrastructure measures can combine safety and efficiency of cyclists and ask car drivers to act respectful to non-motorised modes. It turns out that these measures have a significant positive impact on the road safety of cars as well.

Roundabouts

Roundabouts have proven to be an excellent measure for road safety in the Netherlands. The reconstruction of crossings as roundabouts that started in the 1990's has resulted in a decrease of about 70 per cent of serious accidents. The Dutch roundabouts improve road safety for cycling much better than the roundabouts – with a longer history – in the UK and Ireland. The reasons for this are that Dutch roundabouts control the speed of cars much better and they are also better at confronting drivers that leave the roundabout with cyclists and pedestrians at the roundabout. See figure 5. The number of serious accidents between cars also dropped by 70 per cent.

Advanced stop lines

Another measure that has proven to favour road safety is advanced stop lines for cyclists. Cyclists are allowed to take up a position in front of the cars and to cross before cars can do so. Car drivers can observe them much better and the efficiency of cycling improves very much whereas cars only have a delay a few seconds.

Speed reduction

Speed reduction has proven to be a very effective measure for road safety. This allows car drivers to anticipate cyclists and pedestrians much better and it makes them much more inclined to provide right of way for them. An important measure to reduce speed is to narrow lanes and, of course, this combines very well with the implementation of cycle tracks and cycle lanes.

4. Costs and benefits

Measures to facilitate efficient and safe cycling have a very high cost-benefit ratio. In the EU PROMISING study, cost-benefit calculations were made for single measures. Apart from the investment to implement a measure, mostly only costs and benefits regarding accidents and travel time were included[xvi]. The benefits exceeded the costs many fold most of the times. For example, for area-wide speed reduction measures in residential areas, the benefits exceeded the costs by a ratio of 1 : 10. For bicycle lanes it was also 1 : 10, whilst for advanced stop lines for cycles at junctions it was 1 : 12 and for roundabouts 1 : 8.

5. Developing countries

We can notice a growing interest in planning for cycling in motorised countries. National cycling strategies are adopted in e.g. the UK, Finland, Slovenia and Germany. Even in the USA the investments in cycling are growing fast. The bicycle is rediscovered.

5.1. *Cycling ignored*

In developing countries however, the sole focus on planning for cars is still the most common policy practice, with the same disastrous effects for road safety as in Western Europe in the 1950's and 1960's. Cycling is treated as "a safety hazard and a menace in worsening traffic congestion. City planners commonly refer to the intensifying competition over street space as the 'bicycle problem', suggesting that the bicycle disrupts the car driver's right to the road"[xvii]. The policy of the Chinese city of Guangzhou has been moving from encouragement of non-motorised transport to restrictions, bringing back the share of cycling from 1991 to 1998 from 34 per cent to 20 per cent. Most intersections were not designed to handle conflicts between large numbers of bicycles and motor vehicles. The upgrading of city centre routes to primary road status where bicyclists are either not allowed or faces increasingly unsafe conditions, severed established bicycle routes. Also pedestrians have to travel significant distances out of their way as a result of the upgrading of urban roads and the development of new infrastructure. Cyclists crossing major arterials were forced to share inconvenient overpasses with pedestrians. Safety has deteriorated[xviii].
Mohan and Tiwari analysed several transport planning programs in Asia. The demand for more ring roads, expressways, wider roads and grade separated junctions have dramatic effects on the conditions for alternatives like walking and cycling. But the traffic management problems continue. The authors conclude that transport will operate in sub-optimal conditions if the infrastructure design does not meet the requirements of all modes.[xix]
The World Bank acknowledged the need to break with the past. "An explicit strategy for non-motorised transport is necessary to redress a historic vicious policy circle which has biased urban transport policy unduly in favour of sacrificing the interests of pedestrians and cyclists to those of users of motor vehicles. As a consequence non-motorised transport becomes less safe, less convenient and less attractive, making the forecast decline of non motorised transport a self fulfilling prophesy"[xx].

5.2. Dramatic safety prospects

The road safety prospects for the developing countries are dramatic. For 2000 the estimated world totals or road traffic deaths was 1.2 million. For 2020 these totals are predicted to increase to more than 1.8 million deaths. These increases will be due to large increases in lower-middle and low-income countries, caused by motorization.
However, measures to change this increase in a decrease are well known. The most important measure is road (re) constructions. Annual investments of 0,25% of the GNP on road safety measures have a potential saving of 80% to 90% of the road traffic fatalities. Most important are speed reduction to 30 km/h in living areas and the reduction of differences in speed, direction and mass between nearby road users. Traffic calming measures, pedestrian sidewalks, separated cycle lances are key elements in this approach. The lower-middle and low-income countries should not repeat the error of widening urban roads for through-going traffic, as initially has been the case in high-income countries where they have narrowed these roads in the last decades.[xxi]

6. Conclusions

The integration of cycling – and of walking – in our traffic and transport system requires a change in the planning and the design of our roads. It is simply a matter of giving consideration to the needs of different modes of transport instead of giving all priority to motorised traffic. The different needs have to be compromised. However, it is crucial to promote the fact that measures that integrate motorised and non-motorised modes on our roads also have a huge positive impact on the motorised modes.

A good mix of motorised and non-motorised modes of transport brings the traffic system onto a more human scale. This fits very well with the modern road safety approaches that aim to minimise the risk of serious accidents. A key element in these modern approaches is the prevention of risk by giving due consideration to the limited abilities of human beings, meaning that conflicts between road users with huge differences in mass and speed should be made technically impossible. When people have to share the same road using different modes, the traffic environment should be forgivable to mistakes that people will make. The traffic system should also allow children and elderly people to meet their mobility needs. It should allow pedestrians and cyclists not to be afraid of motorised traffic all the time but to enjoy the pleasure of being outside and on their way. The different tasks we need to perform as road users should never become too complex. The traffic environment should enable all

road users – with their huge differences in skills and experiences – to behave predictably and respectfully to each other.

The consequences for the road network are a categorisation that accommodates the efficient flow of all different modes to a certain extent and protects our urban areas from the domination by motorised traffic. The vast majority of the whole road network has a low speed limit and is adapted to facilitate cycling and walking in a safe way. A residential function is returned to these roads.

The policy towards a sustainable traffic and transport system is traditionally based on the demand to protect the environment, to increase health and to create an attractive city climate.
The promotion of cycling fits very well with these aims.
Safety is often presented as a conflicting aim with cycling mobility since the risk of being killed as car driver is lower than the risk of being killed as cyclist. However, for an analysis of the effects of more cycling use on road safety, comparing these risks is not a relevant exercise, it is a static approach. The risk differences may ever remain, while a promotion policy for cycling may result in a significant positive change of road safety. We have to look at the dynamics we may bring about. A significant increase of cycling will only occur when the safety needs of cyclists are catered for. This must be effectuated by good planning and design and this will bring the road safety problems of all road users down. It may not be primarily the cycling facilities to segregate cycling from other modes on the road that will increase the safety of cycling, but the integration of cycling in the overall design. Cycling is therefore a catalyst for a very successful road safety policy.

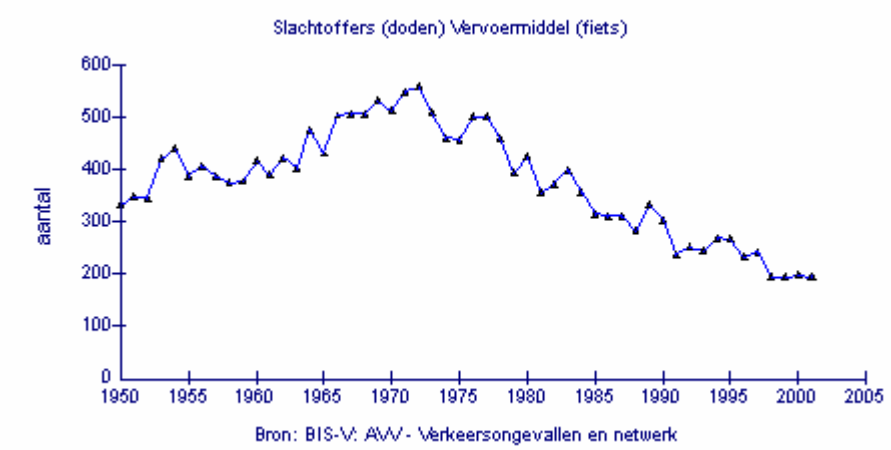
Table 1: Bicycle mileage per person and killed cyclists per mileage in ten countries; Source: WALCYNG, Report1. no.4, 1997, Lund University Sweden and Factum Austria

Bicycle Kilometres and Killed Cyclists per kilometre	Cycling kilometres per person per day	Killed cyclists per 100 million kilometres
GREAT BRITAIN	0.1	6.0
ITALY	0.2	11.0
AUSTRIA	0.4	6.8
NORWAY	0.4	3.0
SWITZERLAND	0.5	3.7
FINLAND	0.7	5.0
GERMANY	0.8	3.6
SWEDEN	0.9	1.8
DENMARK	1.7	2.3
THE NETHERLANDS	3.0	1.6

Table 2: Risk for a fatal accident per kilometre travelled in the Netherlands per car or on the bike for different age categories. The calculation of the risk of car driving excludes all kilometres on freeways since these roads are not comparable and includes the risk road users present to other road users. Source: Cycling: the way ahead for towns and cities; EU, 1999

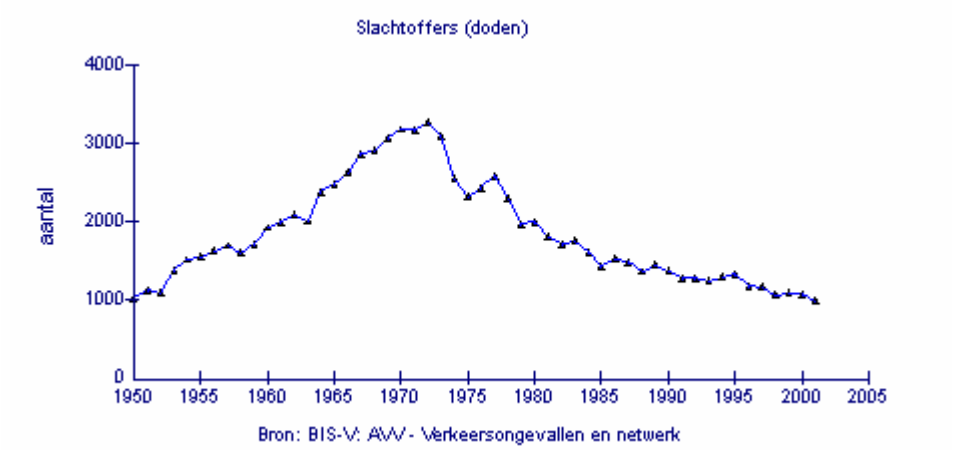
Fatal risk per billion kilometres in the Netherlands	Car drivers	Cyclists
12 - 14 years	---	16.8
15 - 17 years	---	18.2
18 - 24 years	33.5	7.7
25 - 29 years	17.0	8.2
30 - 39 years	9.7	7.0
40 - 49 years	9.7	9.2
50 - 59 years	5.9	17.2
60 - 64 years	10.4	32.1
> 64	39.9	79.1
Total	20.8	21.0

Figure 2: Fatalities per mode of transport (Bicycling)



Source: BIS-V (Policy Information System on Safety): AVV (Traffic and Transport Centre of the Dutch Ministry of Traffic and Waterways) – Verkeersongevallen (Traffic accidents).

Figure 3: Fatalities per mode of transport (all)



Source: BIS-V (Policy Information System on Safety): AVV (Traffic and Transport Centre of the Dutch Ministry of Traffic and Waterways) – Verkeersongevallen (Traffic accidents).

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