

Healthy and Bicycle-Friendly School Roads

- Guide with ideas for healthy and active transport



Title:

Healthy and bicycle-friendly school road, 2012

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Layout:

Zeuner Grafisk as

Printing: Danish Cancer Society

Print run:

100 copies

Publisher:

The Danish Cancer Society, Strandboulevarden 49, 2100 Copenhagen

The danish publication is funded by the Danish National Board of Health as
part of the 2012 Get Moving campaign.

The Danish Cancer Society has made an electronic, printer-friendly version
of this document available at <http://www.cancer.dk/bike>

PREFACE

This guide focuses on how municipalities can utilise structural prevention to make cycling the healthiest, safest and easiest mode of transport to and from school.

The guide is targeted to municipalities, making it easier to design healthy and bicycle-friendly school roads, thus motivating more children and young people to cycle. The publication explains why it is important to work with structural prevention; secondly, it aims to provide an overview of this area and inspiration for taking action to implement effective, cost-efficient solutions.

It is important that municipalities work across departments to ensure a connection between their ongoing infrastructure projects and the multifaceted interests in healthy children who are able to travel safely to and from school. The greatest possible benefit for citizens is attained by incorporating the wide range of interests into these efforts.

Until now, the primary focus has been on how various infrastructural improvements reduce the number of accidents, which is also reflected in this manual. In the future, it will be just as important to focus on how

many more people we can inspire to cycle to and from school by creating intelligent solutions.

The background for this publication is the Danish National Board of Health's 2012 "Get Moving" campaign, held from week 16 to 18 both nationally and locally. The local campaign efforts are conducted for the Danish National Board of Health through partnerships, including with the Danish Cancer Society.

"Get Moving" highlights the Danish National Board of Health's recommendation that children and young people should be physically active for at least 60 minutes a day. The activity must be moderate to high intensity. If it is divided up into smaller increments, each must be continuous for at least 10 minutes, which means that the physical activity must exceed ordinary short-term activities, as these rarely last for more than 10 consecutive minutes. Active transport that exceeds 10 minutes, such as cycling to school, counts towards these 60 minutes.

So we're setting the wheels in motion. Happy reading!



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INTRODUCTION

This guide focuses on how municipalities can utilise structural prevention to make cycling the healthiest, safest and easiest mode of transport to and from school. The guide is targeted to municipalities, making it easier to design healthy and bicycle-friendly school roads, thus motivating more children and young people to cycle. The publication provides arguments explaining why it is important to work with structural prevention; secondly, it aims provide an overview of this area and inspiration for taking action. Until now, the primary focus has been on how various infrastructural improvements reduce the number of accidents, which is also reflected in this manual. In the future, it will be just as important to focus on how many more people we can inspire to cycle to and from school by creating intelligent solutions.

Children at play have a spontaneous approach to physical activity. A change is occurring in children and young people's level of physical activity, as they are presented with more and more inactive leisure activities. This includes computer games, more time in front of the television, transport by car and bus, etc. Thus, children and young people's surroundings are important parameters for a physically active life. It is important to motivate and keep children and young people in healthy habits, as studies show that the older children get, the less physically active they are. 2/3 of all 11 to 15-year-olds do not meet the Danish National Board of Health's recommendation of 60 minutes of physical activity a day.¹ Furthermore, 11 to 15-year-old children's car trips have tripled from 1978 to 2000.² In the past 30 years, the proportion of children driven to and from school has increased by 200 % at all ages.³

Big gains can be made by changing the habits of inactive children and young people to cycle to school. Children and young people who cycle to school also use their bicycle the rest of the day and thus are generally more physically active than children who do not cycle. Getting more children to use their bicycle daily creates the basis for healthy habits that prevent lifestyle diseases, including cancer.⁴

It has been shown that children and young people who cycle to school have 8 % better fitness than the children and young people who are driven or walk to school.⁵ A difference of 8 % may not sound like much, but it corresponds to a 50 % decrease in the share of children and young people who are at increased risk of metabolic syndromes (including abdominal obesity, insulin resistance, hypertension and hyperlipidaemia).⁶

For many adults, exercise is a central reason for choosing cycling as a means of transport. This also applies when people are asked what would get adults to cycle more. In busy lives, the combination of exercise and transport can be an all-important factor for choosing cycling as a means of transport. Therefore,

the health aspect can be used when working to change children and adults' transport behaviour. In addition, the cross-departmental cooperation between municipal administrations can be strengthened by also considering the health effects in addition to traffic reasons, environmental concerns, etc.⁷

In many municipalities, cycling is incorporated into health policies and as a means of promoting health. Cooperation can provide added value to available funds, improve the ability to activate inactive citizens and encourage more people – particularly children and young people – to choose cycling as a means of transport. Thus, a good interdisciplinary cooperation between administrations can promote health and bicycle-friendly school roads for the municipality's children and young people.

Work with children and young people's motivation and understanding of the importance of being physically active is a challenge. It is difficult to teach children and young people to be physically active in surroundings that do not encourage such activity. Structural prevention – a framework that makes healthy, and in this case active, choices easy – is a method for getting more children and young people to be physically active. Studies show that information only reaches a small proportion of the population. Individual guidance is required to reach a greater number of citizens, but demands extensive resources and is very costly. These same studies also show that structural measures reach a broad range of citizens; thus this guide focuses on structural measures for getting more children and young people to choose cycling as a mode of transport to school.

It is no use to implement good structural measures if the municipality does not inform the public about them. Therefore, the municipality must remember to make people (especially parents) aware of the improved conditions. Communication is a vital element for getting more children and young people to cycle to and from school.

The following pages provide examples of ideas for structural measures that promote active transport to and from school. These measures were chosen for being realistic and effective. The measures presented do not include very expensive construction projects. On the contrary, many of the solutions are quite inexpensive and can thus be implemented extensively. Safe school roads are a critical prerequisite for enabling more children to travel alone to and from school. First, a review outlines the legal requirements municipalities must consider and why school roads are designed as they are. This is followed by suggestions for determining where to take action, proposed traffic measures and a section on other possibilities in addition to structural measures.

WHAT IS REQUIRED BY LAW?

Legislation regulates the design of roads and municipal obligations in relation to the transport of school children.

The Road Traffic Act

A revision of the Road Traffic Act in 1976 placed safe school roads on the agenda. Section 3(3) of the act states:

“It is incumbent on the police and road authorities, in consultation with the schools, to implement measures to protect children from the dangers of vehicular traffic on their way to and from school.”

This legal provision is dealt with very differently in the municipalities. But there is no doubt that the clear intention of the law is to ensure a special effort for the safety of school children in traffic. A previous enquiry by Odense Municipality to the then Ministry of Traffic showed that school children in this regard includes upper secondary education and that children is defined as up to 18 years of age.

Transport

The Danish Act on Primary and Lower Secondary School clarifies the municipalities' transport obligation, including taxi, school bus or public bus transport to and from school. Section 26 states:

The municipal council must provide transport between the school or transition programme institution and the home or vicinity hereof, cf. chapter 2 a and chapter 2 a in the Act on Educational and Occupational Guidance, for:

- 1) children who must travel more than 2½ km to school in preschool class and 1st-3rd form, 6 km in 4th-6th form, 7 km in 7th-9th form, 9 km in 10th form, and
- 2) children with a shorter distance to school, if consideration of the children's safety in traffic makes it particularly necessary.

In a 1978 circular, the Danish Ministry of Justice defined the term school road and what can be regarded as dangerous on these roads. The municipalities were thus obliged to conduct risk assessments of the school roads. If a school road is deemed to be dangerous, the municipality has the choice between municipal transport or physical measures on the road that contribute to the safety of the school road.

Subsection 5 further states that:

The duty to provide transport under subsection 1 can be fulfilled by referring students to public transport or by reimbursing the costs of their own transport.

If the student has chosen a different school than the district school, the transport requirement does not apply. After school institutions are defined as a private activity for which citizens are not eligible for free transport. Some private schools have their own transport schemes.

Every application for transport reimbursement is associated with an individual student and must be reapplied for every year. However, a residential area may be assessed as a whole when defining

the limits for safe bicycle and pedestrian traffic. Some municipalities also choose to distinguish between summer and winter due to the different needs for lighting and snow removal.

Economic consequences

The Danish Act on Primary and Lower Secondary School effectively enables municipalities to choose which school roads are considered dangerous, as there are no actual risk assessments of school roads. Thus it is a local political issue of prioritising resources. The municipality's professional assessment of the school roads should be isolated from its desire to save on transport costs.

“Overall, an investment in safe school roads can be recouped within just a few years, as a one-time investment can replace operating expenditures on transport and health.”

Typically, the local police also assess the school roads; a sensible policy is that if either the road authorities or police deem the school road to be dangerous, then it must be defined as dangerous.

About 80 % of the Danish municipalities take special initiatives regarding school children's transport and traffic safety.⁸ Half of the improvement in children's traffic safety can be attributed to the municipalities' special initiatives. Thus, municipal traffic safety initiatives aimed at school children have a very significant impact on children's traffic safety.

Popularly speaking, one can say that when it is safe for children, it is safe for everyone – safe school roads create a city for everyone, where everyday exercise can be integrated with the daily trip to school and work.

Calculations have been made of the worth of bicycle traffic to society and to the individual. One kilometre on a bicycle costs DKK 0.60, while one kilometre by car costs DKK 3.74. The increased time used by cyclists weighs heavily in the calculation – if the cyclist's time was counted as free exercise time, cycling would actually earn nearly DKK 5.50 per kilometre. A large portion of these earnings would go to the cyclists themselves, as the internalised earnings comprise approx. DKK 3.80 per kilometre. At the same time, the health service and state receive the remaining earnings of DKK 1.81 per kilometre. Earnings such as these include saved expenses and increased value growth from work, as cycling leads to fewer sick days and medical treatment expenses. These calculated health effects are based on the assumption that half of all cyclists are already physically fit and thus do not gain additional earnings, while the remaining half gains full earnings. Reduced health care costs and increased longevity are major gains for society and the individual cyclist.⁷

Overall, an investment in safe school roads can be recouped within just a few years, as a one-time investment can replace operating expenditures on transport and health.



The sign says:
"Watch out for the young ones in traffic"



SCHOOL ROAD ANALYSES

School road analyses can shed light on children's transport to school, providing an overview of the modes of transport they use and where there are safety issues. Insecurity is also examined, as this may indicate safety problems that are not identified through the registered traffic accidents. Furthermore, insecurity often means that parents do not let their children travel to school on their own.

School road analyses are conducted to provide an overview of the situation of school children in traffic. Sometimes these analyses also include school children's leisure trips. The first Danish school road analyses were done using aerial photos and paper, while today they are conducted via internet. Typically they are done in the classroom with the support of teachers. If the students are to complete the analyses at home, they risk identifying the parents' and not the children's insecurities.

Resource consumption considerations mean that sometimes only 3rd, 6th and 9th form students are surveyed. A report is produced for each school, and the private schools should also be included. A revised analysis may be necessary after 3-5 years.

School road analyses typically comprise:

1. Traffic accidents
2. Insecurity
3. Children's routes
4. Outline proposals

Aarhus Municipality has also chosen to define recommended routes for each school.

It is possible to include other traffic-related questions, such as the use of bicycle helmets, accompaniment by adults, etc.

Traffic accidents

A survey is conducted of traffic accidents on the roads primarily used by school children. As the police typically have a very low reporting rate, especially for accidents involving vulnerable road users, emergency room reporting can provide a much better data basis. This requires great effort on the part of hospitals and thus can be very difficult to implement and maintain. Odense is a pioneer municipality, where for more than 30 years emergency room registration has been an important part of the work with safe school roads, and where a very high proportion of children walk and cycle to school.

“Focusing on getting more people to cycle ensures a greater health impact for the implemented improvements.”



School roads in Elsinore and the most insecure locations, marked by colour according to the number of children who have identified the location as insecure.

Alternatively, the accidents reported to police can be supplemented with self-reported accidents. This is typically done using an electronic form on a website. The system has an obvious weakness in terms of incomplete reporting, but this information can still be a useful supplement. Projects involving self-reported traffic accidents have been conducted in municipalities including Støvring, Aalborg and Viborg.⁹

“Investing in healthy and active children will also have an impact when the children become adults and have children of their own.”

Insecurity

Children's insecurity can be seen as an indicator of where accidents may occur. In fact, they point to the locations where the most accidents occur, but sometimes also to places where there are not very many accidents. However, insecure locations on a school road means that parents will have a greater tendency to drive their children to school.

The number of children who identify a stretch of road or an intersection as insecure is vital to the prioritisation of locations. For each insecure location, it may be helpful to ask children to explain the reasons that they feel insecure – this can provide useful knowledge in determining the optimum solutions.

Children's routes

It is also important that children indicate their routes to and from school. Typically, it will be the shortest route, even though a slightly longer route will sometimes be much safer.

Outline proposals

Based on the traffic accidents, insecurity and children's routes, a number of prioritised proposals are presented for improving

school road safety and getting more children to cycle and walk to school.

The outline proposals are prioritised across schools and form the basis for implementing a number of projects each year. Here it is natural to operate with a fixed annual budget framework. A number of school road projects are typically implemented via other major construction projects.

Prioritisation model

Aarhus Municipality has chosen to utilise a prioritisation model based on four parameters:

- Potential, which indicates the number of addresses and thus potential students for whom the road presents the shortest route to school.
- Form, which indicates whether the improvement will result in students in lower forms being able to use the route.
- Impact, which indicates an assessment of the improvement provided by the project in that location.
- Price, which indicates an estimated cost of the project.

For each parameter, a project can be assigned a number of points, which are then weighted as follows:

- Potential 20 %
- Form 20 %
- Impact 20 %
- Price 40 %

Impact

Comparing municipalities shows a clear and significant difference in the municipality where this work has been ongoing for more than 30 years. In Odense, the number of children who cycle and

walk to school is about 80 %, while this figure in a municipality such as Fredericia, where similar initiatives are just starting, is at 65 % despite shorter distances and lower traffic volumes. The data is collected in connection with the school road analyses.

In addition to a focus on traffic safety, it is vital in future infrastructure improvement projects to also examine the impact on the number of children who cycle to and from school. This can be done quite easily as an integrated part of conducting school road analyses, which can help to estimate the health benefits of investments and give schools an opportunity to get involved in these issues. There is a documented connection between physical activity and learning, regardless of age.¹⁰

Focusing on getting more people to cycle ensures a greater health impact for the implemented improvements. One of the elements that can have a decisive effect on how many children cycle to school is the location of the school. With this in mind, the location of new schools is particularly important. Here it is vital to consider the school road and potential for active transport.

Investing in healthy and active children will also have an impact when the children become adults and have children of their own. The physical improvements are permanent and good traffic habits are often passed on to the next generation.

“...more than 30 years emergency room registration has been an important part of the work with safe school roads, and where a very high proportion of children walk and cycle to school.”

SPEED REDUCTION

You can choose to separate road users, such as with bicycle paths, bridges and tunnels, or you can choose to integrate them in a safer way. Integration is typically the most inexpensive method, but must be done with consideration for the weakest road users, i.e. with reduced speed. Generally speaking, 30 km/h is the maximum speed that a person can tolerate in a collision if the damage is to be reparable. But the slower the better for vulnerable road users.

Speed limit

Lower speed limits can be an effective and inexpensive solution on many school roads. But this requires that motorists comply with the new speed limits, which they do not; however, lower speed limits always result in lower speeds.

Generally, you can expect that a change in speed limit of 10 km/h reduces the average speed by 2.5 km/h. Changing a 60 km/h speed limit to 40 km/h, gives an expected reduction in speed of 5 km/h, or 10 %, and thus 19 % fewer injury accidents.¹¹



Electronic speed limit by a school, where the limit applies for a 200 metre stretch.

With electronically variable speed signs, you can restrict the lower speed limits to when school children are on the road. For example, the City of Copenhagen established a speed limit of 40 km/h around an existing pedestrian crossing on Sjøelør Boulevard, which is in effect during school hours. The sign is set to

display 40 km/h with 0-100m below, so that the speed limit applies from the sign to the pedestrian crossing.¹²

In Norway, electronic speed limit signs around nine schools resulted in a speed reduction of 2-11 km/h.¹¹

Bump

Bumps are a very effective means of reducing speeds. They are available for all desired speeds and the design is determined by the traffic regulations.¹³ A key choice is whether you are willing to interrupt the sides of the bump just before the curb, thus saving a large share of the cost by avoiding reconstruction of drainage. There are bumps that protect busses and can be placed where there are bus lines.

“In Norway, electronic speed limit signs around nine schools resulted in a speed reduction of 2-11 km/h.”

Establishment of quiet roads in the City of Copenhagen has resulted in a 25-30 % decrease in accidents and injuries. Safety is improved due to fewer side collisions and fewer pedestrian and parking accidents. However, there may be safety problems with pillars at speed reducing structures. Motorists and pedestrians in particular have benefited in terms of safety from the traffic reduction measures.¹⁴

Other studies of bumps show a halving of injury accidents.¹⁵

Bumps are a very effective means of ensuring safe school roads.





The speed limit can be emphasised with smileys.

Speed zones

Speed zones are particularly common in Germany and Holland. They involve a speed limit of 30 or 40 km/h and have either no or few speed reducing measures. The intention is that motorists should not be in doubt about the speed limit and should be able to take an alternative route if they do not have an errand in the neighbourhood.

Gladsaxe Municipality has established speed differentiation with 40 km/h and 30 km/h zones on approx. 100 km of residential roads. There are few physical measures; the zone signs are supplemented with just a few bumps in selected locations. There are total of 350 zone signs and 55 bumps. Studies have shown a 19 % decrease in average speeds. The volume of accidents in these zones fell by 30 %.¹⁶

Odense Municipality carried out the project “Living roads”, where two residential neighbourhoods implemented speed limits of 30 km/h and a limited number of physical measures. Residents were involved in the process, including a number of campaign activities associated with the project to generate a greater sense of ownership and respect for speed.¹⁷

Speed signs

Electronic speed signs can be used in areas where many motorists exceed the speed limit and are often seen near schools. Speed signs can be used as permanent or mobile equipment. Speed signs result in a lasting reduction of speed. In urban areas,

speed signs cause a 2-10 km/t decrease in average speed. The decrease depends on the speed level and the speed limit at the location prior to installation of the sign. The greater the degree of speeding prior to installation, the greater the subsequent decrease in speed. The average decrease is 5 km/h.

According to a Danish study, speed signs at the entrance to cities result in a 30 % reduction in injury accidents.¹⁸ Generally, you can expect a 40 % reduction in the number of speeding motorists.¹⁹



A speed sign can be combined with a warning sign indicating school children in the area.

CYCLE PATHS AND CYCLE LANES

Cycle paths and cycle lanes give a function-divided street, where cyclists and motorists have separate areas. Motorists typically have a slightly narrower lane, but their speed only changes marginally.

Cycle paths and cycle lanes are legally the same – motorists may not use these areas. However, the kerb provides a secure separation that is not achieved with paint alone. On the other hand, there is a very big price difference.

A cycle path must be established with enough space to pass another cyclist safely. Thus, the recommended width of 2.2 metres must not be reduced to less than 2.0 metres.

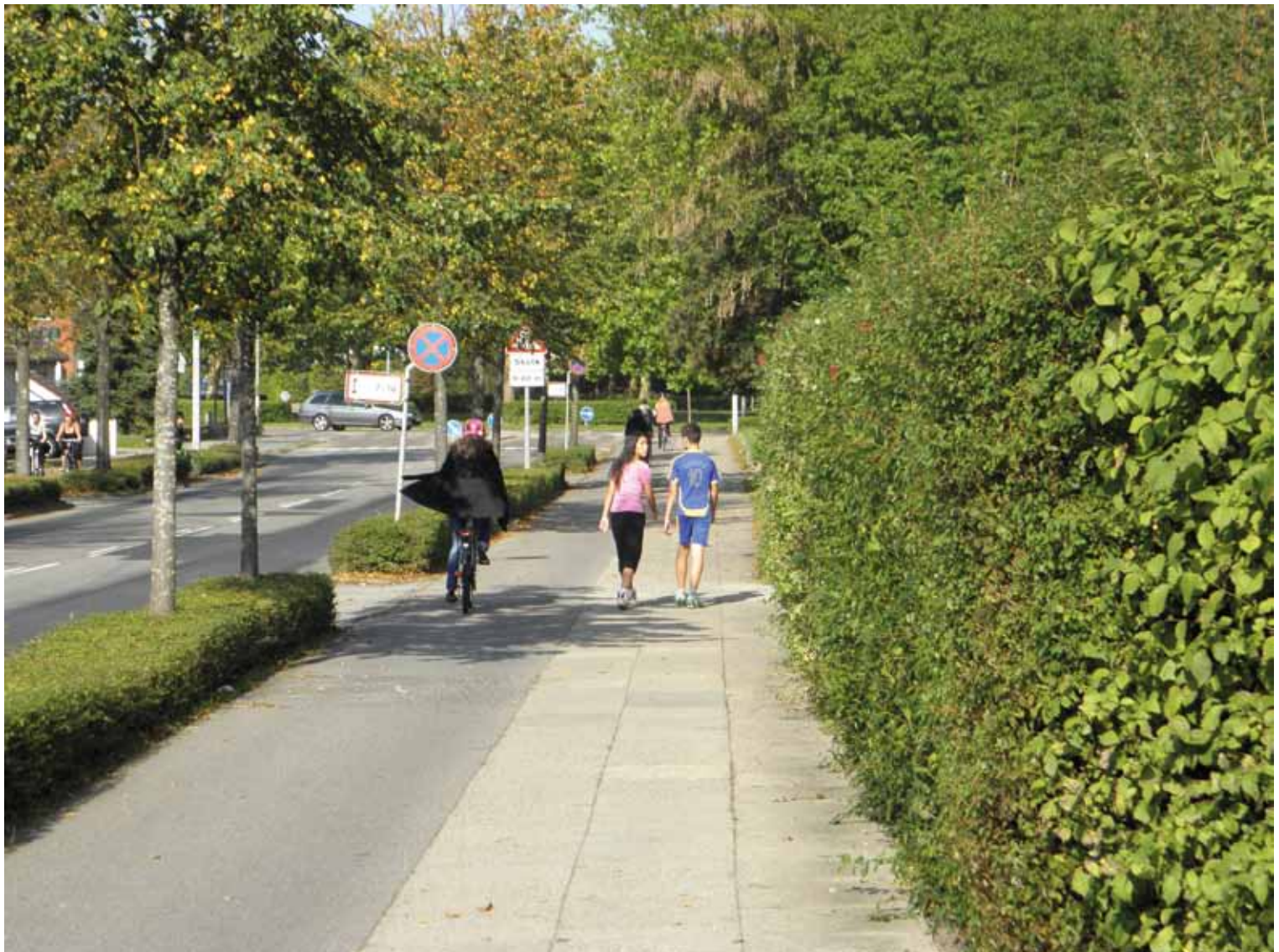
Typically speaking, cycle paths result in a 20 % increase in cyclists from day one. These are primarily cyclists attracted from other routes, but in the longer term, new cyclists also appear. For many parents, the possibility of using a cycle path is the determining factor in whether their children are allowed to cycle to school. Constructing cycle paths along roads in open country halves

“Typically speaking, cycle paths result in a 20 % increase in cyclists from day one.”

the number of cycle and moped accidents, while accidents with pedestrians is reduced by one-third. Accidents with cyclists and moped riders also tend to be less serious.¹⁸

The City of Copenhagen has studied cyclists' sense of security in mixed traffic, cycle lanes and cycle paths. 31 % of cyclists felt somewhat or very secure in mixed traffic, while the figures were 72 % and 77 % for cycle lanes and cycle paths, respectively.²⁰

Cycle paths are an expensive but necessary solution in many places.





Combining a cycle path with parked cars enhances safety..

The road by Humlebæk School has been made one-way, with half of the road transformed into a two-way cycle path²¹



INTERSECTION

Road users cross paths in intersections, and this is where school children can have difficulty navigating. Simplicity and low speed are often a part of the solution.

Traffic lights

Signal regulation of the right of way at intersections is established for two reasons: to ensure more equitable passage for all directions and to ensure that all road user groups can cross safely.

Signal regulation of intersections can be usefully coordinated with nearby signals, as the combination often provides safety improvements in the new and adjacent signal-regulated intersections, as well as in the stretch between the two intersections. In special cases, it may be expedient to replace accident-ridden roundabouts with signal-regulated intersections.

Signal regulation of right of way in a T-intersection provides a 15 % reduction in both personal injuries and property damage accidents. Signal regulation of right of way in a four-way intersection

provides a 30 % and 35 % reduction in personal injuries and property damage accidents, respectively. There is also a decrease in accidents on the roads leading to signal regulated intersections. Young children find traffic light regulated intersections very straightforward to understand. The problem occurs when motorists do not respect the red light and right of way in the intersection itself. Here, divided phases, centre islands, recessed stop lines and time extensions for green lights and in between changes can help children.

“Simplicity and low speed are often a part of the solution.”

Left-turning cyclists can position themselves by the detector pole and wait for the green light.



Blue lanes

Leading up to signal regulated intersections with cycle paths or cycle lanes, a blue cycle lane through the intersection improves traffic safety. Establishing a blue cycle lane provides a 30-40 % reduction in the number of injury accidents involving cyclists. However, this only applies if there is only one blue cycle lane.

A Danish study of the safety impact of blue cycle lanes indicates that establishing two or more blue cycle lanes causes more

accidents. In signal regulated intersections with more than one blue cycle lane, accidents can be reduced by removing some of the blue lanes.¹⁸

Blinking Lights

Pedestrian crossings can gain increased visibility by establishing blinking yellow lights that enhance motorists' attention. The safety effect of these lights has not been studied.



Only one blue cycle lane is located in this intersection, reflecting the safest solution.



Blinking yellow lights enhance the visibility of the pedestrian crossing

Crossings

A crossing is a pavement that continues uninterrupted across the intersecting road, thus emphasising the duty to give way. The pavement thus serves as a plateau bump with steep ramps. If the ramps flatten out too much, the safety effect is diminished.

Particularly in cases where there is a "broken priority", i.e. an unorthodox duty to give way on the road, it can be beneficial to establish a crossing on the road where motorists have the duty to give way.

Child pedestrians and cyclists benefit from the improved safety that crossings provide. Establishing a raised surface in an existing pedestrian crossing causes a 40 % decrease in the number of accidents in the crossing and up to 50 metres from the intersection.²⁴ There are numerous studies of the impact of crossings – generally they result in 40 % fewer pedestrian accidents and 20 % fewer cyclist accidents.¹⁸

“Establishing a blue cycle lane provides a 30-40 % reduction in the number of injury accidents involving cyclist.”



*A crossing enhances safety
for pedestrians and cyclists.*

Raised intersection

A raised intersection acts as a bump for traffic in all directions and ensures the lowest speed where conflict is greatest. The raised intersection can be established using many different types of stone and concrete, but asphalt is the cheapest and just as effective.



The raised intersection here is located in a play and open space, so traffic in all directions must give way.

Reversed duty to give way

A simple and inexpensive measure is to reverse the duty to give way. This increases the speed in the other direction, so you must be certain that it provides increased safety on the whole for school children.

If the children primarily travel in one direction, they can benefit from the other direction having the duty to give way.



The reversed duty to give way is marked with a raised, uninterrupted cycle path, blue lane and duty to give way signs with text below.



You can choose to increase the visibility by placing a large give-way symbol on the road 50 metres before the give way line. In connection with changing the duty to give way, temporary signs may be needed to clearly show road users the change.

You can increase the visibility of the changed duty to give way.



A mini-roundabout can be made more visible by using centre island and signs under the duty to give way signs.

Mini-roundabouts

Unlike traditional roundabouts, mini-roundabouts are quite small and thus relatively inexpensive to establish – from DKK 150,000. The size means that the central islands are typically designed so that the back wheels of larger vehicles can drive over the centre. Mini-roundabouts are well-suited for less busy streets to replace the ordinary duty to give way. Converting a four-way intersection provides a easy way of reducing speeds 10-30 km/h in all

directions – a vital reduction for school children who travel along and cross these streets.

Conversion of a standard intersection with the duty to give way or signal regulation to standard roundabouts results in a 15 % increase in both bicycle accidents and personal injuries to cyclists. Standard roundabouts are better suited for areas with limited bicycle traffic. The effect of establishing mini-roundabouts is not yet well documented.¹⁸

Left-turn lane for cyclists

When cyclists need to turn left in a T-intersection, it may be beneficial to establish a left-turn lane that protects them from straight moving cars from behind. The left-turn lane can provide cyclists with a sense of calm so that they wait to cross until it is completely safe.

Centre islands and side islands

Islands can make crossing the road safer for pedestrians and cyclists. Quite simply, a centre island means that crossing traffic in two directions is divided into crossing one direction at a time.



A left-turn lane on the side of the road can be very valuable to cyclists.

A side island can enable a child to establish the best possible overview of the road before crossing.

A variant of this is prefabricated islands, which can be placed on roads in a very short time. If the situation changes, they can be removed and located elsewhere.

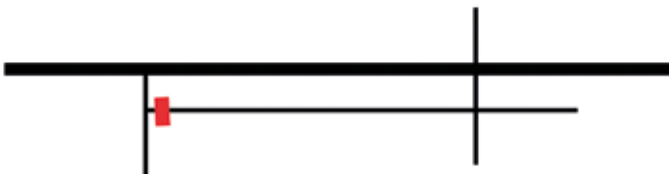
Establishing a centre island in an existing pedestrian crossing reduces the number of accidents in the crossing and up to 50 metres from the crossing by 25 %¹⁸.



The centre islands are bolted to the road and can be moved if the situation changes – shown here is an example from Odense, where the island is removed in connection with a cycle race.

Road closures

A road closure is an effective and cheap way of reducing car traffic. Typically, these are local roads where there are reasonable alternative routes for car traffic, while pedestrians and cyclists are allowed access.



It is necessary for cars to be able to turn around at the road closure. It isn't always necessary to establish a turning space, as a slightly larger driveway or side road can provide the ability to turn around.

Around Hornslet School in Syddjurs Municipality, two trials restricting car traffic were conducted in connection with 6-week campaign activities. The proportion of children who travelled to school by foot or cycle increased from 56 % to 68 % and 71 % respectively.²²

“The proportion of children who travelled to school by foot or cycle increased from 56 % to 68 % and 71 % respectively.”

Road closures allow cyclists and pedestrians to pass through.



PARKING

Parking possibilities have a great impact on safety around the school and how easy it is to drive children to school.

Parking restrictions

There may be good reason to impose strict controls on parking around schools. A division of functions should be implemented that makes it safe for school children, while making it simple and manageable for drivers.

Personnel parking must be located on the school grounds and otherwise far from the school's entrances. No time limit is placed on this parking.

Driving children to school should be possible, but not attractive. Therefore, it is good to allocate a smaller area where parking is prohibited, but stopping is permitted for "kiss goodbye and drive". If you want to make it possible to park and accompany smaller children or children with special needs into the school, you can allocate an area with 15-minute parking.

It is beneficial if the passenger door opens towards the school.

Flex parking

Copenhagen has conducted a project with flexible parking spaces called flex parking, where cyclists and motorists take turns using

the parking space on the street according to need. The trial began in 2011 and comprised five parking spaces in front of Ingrid Jespersens Upper Secondary School in Østerbro. During school hours, from 7am-5pm, the parking space is reserved for bicycle parking and from 5pm-7am it is used for general car parking.

Experiences show that both cyclists and motorists have problems vacating the parking space when their time expires. Cyclists are very good at parking bicycles perpendicular to the kerb so that they take up minimal space. Cyclists also move around each others' bicycles a little bit to make room for more bicycles than when using bicycle racks.



Flex parking splits time between parked bicycles and cars.

Here, drivers can park briefly and accompany small children into the school.



THE SCHOOL AND PARENTS

As mentioned in the previous section, infrastructure is important for creating the basis for active transport to school that is both safe and secure. The following presents suggestions and examples of structural measures that can provide the next step towards getting even more children and young people to choose to cycle to school.

“By working with communications, awareness of these issues will increase, making it easier to obtain political support in the future.”

The Danish Act on Primary and Lower Secondary School does not provide guidelines on schools' ability to implement structural measures, campaigns, counselling and the like to motivate children to choose active transport to and from school. Therefore, there are good opportunities for schools to start their own initiatives.



Odense Municipality produced a children's book encouraging children and adults to cycle more together.

Communication

All of the previously described measures have a positive effect in relation to greater safety for children and young people on their way to school. To ensure that the improvements have the desired effect in relation to new cyclists, it is important that the municipality and school collaborate to communicate these improvements to citizens. Awareness of these improvements can be promoted through cooperation with the schools, via the schools' communication channels (digital and parent meetings). Press releases can also be issued to local media with the message that there are now even better possibilities for cycling to school. By working with communications, awareness of these issues will increase, making it easier to obtain political support in the future.

Follow your child

Many parents forget that practice makes perfect. It is not enough to teach children about traffic and road rules – they also need training. Furthermore, children can travel on virtually all school roads if accompanied by an adult.

This applies both on foot and by bicycle.

It can be beneficial to conduct activities that encourage more people to follow their child to and from school. It should be both fun and common sense to accompany one's child in traffic. For example, you can conduct a car-free week, where the youngest students must be accompanied to school without a car.



Odense Municipality produced a book focusing on children's abilities in traffic.

Walking bus and bicycle bus

A walking bus typically comprises 4-10 children who, together with an adult “driver”, walk to and from school along a predetermined route with agreed stops along the way. Typically, students who live close to each other are in the same “bus”. All participants in the walking bus are usually equipped with a reflective vest.

Parents can take turns in the role of “driver” and plan a schedule amongst themselves. Older students or pensioners may also serve as the “driver”.

The advantages of a walking bus are fewer cars, better safety and more exercise.

“The advantages of a walking bus are fewer cars, better safety and more exercise.”

Hornbæk School has established an extensive system with three walking bus routes and three bicycle bus routes. The school has established a calendar for administration of bookings. Here, parents enter the days that their children will use the bus and the days that they can be a driver. They must also indicate the days on which they can be a “substitute driver”. At least two adults are required for the first 15 children in the walking bus. Then, an additional driver is needed for the next 10 children.

Lund School in Horsens uses the student council, whose older members act as “drivers”. The student council started up the scheme on their own initiative and with a coordinating teacher at the school.

For its bicycle bus, Lyngholm School in Farum uses drivers from 6th to 8th form and some parents. There were approx. 10 passengers out of 30 students in preschool to 5th form. Half of these children would have been driven to school and half cycled more frequently to school after the establishment of the bicycle bus.²³

Traffic policy at schools

Many schools have adopted a traffic policy focusing on beha-

Horsens Municipality organised walking busses for the youngest students at Lund School, which in 2011 celebrated the 5-year anniversary of walking busses in icy cold weather.





The traffic policy at Bøgeskov School in Fredericia is formed as a poster with objectives and ideas for future activities. The process comprised a workshop with students, teachers and the school board.

viour and collective responsibility in addition to physical changes. A major study has shown the following results²⁴:

- 744 schools participated in the study.
- 37 % had a traffic policy.
- 63 % did not have a policy but had implemented specific traffic measures.
- 8 out of 10 schools with a traffic policy experienced a positive impact.
- The impact is often in the form of more considerate behaviour and more students who cycle to school.

Many schools experience problems with car traffic, particularly in the morning. This often leads to schools and parents asking the municipality to improve the conditions. But physical measures is not the solution to all problems. Instead there is a need for a change in behaviour, where more students cycle and walk to school and where parents in cars show greater consideration.

This can be achieved through a traffic policy. The purpose of a traffic policy is typically to get everyone to take responsibility for improving the conditions. Parents in cars can make sure to park considerately in the morning while the school can ensure that students learn about traffic safety and that teachers serve as good role models. The municipality is responsible for creating a good physical framework.

It is crucial for the policy that the school has appointed a highly

committed person with responsibility for everyday traffic issues – typically the school's traffic contact teacher. The school can allocate extra hours for the teacher's work relating to the traffic policy, typically 50 hours. And the teacher can attend a course to become well-equipped for the task. The municipality can improve the teacher's conditions by providing advice on traffic and arranging a collaboration with other schools. The school board should approve the policy and help communicate it to all parents. In addition, the police, other teachers, parents and students can be involved in this work.

The study of traffic policies at schools has shown good and bad examples of involving the municipality's technical administration in preparing the traffic policy. In the good examples, the school has had one designated contact person with good knowledge of the local issues at the school.

“Half of these children would have been driven to school and half cycled more frequently to school after the establishment of the bicycle bus.”

“The initiatives have been such a great success that the school had to build more bicycle parking spaces because of the many students who began cycling to school.”

A common characteristic of the bad examples is that the person in the technical administration did not have sufficient knowledge of traffic policies in general and therefore could not provide advice to the school. Another example is that a school wanted physical measures financed by the municipality, but the technical administration was not able to oblige. Therefore, it is important from the start that the municipality and the school align their expectations regarding finances.

But even though the school is focused on improving traffic in the morning, it is important to also address other aspects in the traffic policy, e.g. education and promoting cycling in general. A number of schools in the study chose to base their efforts on a template prepared by the Council for Safe Traffic, www.sikkertrafik.dk. Some schools have benefited greatly from participating in a process where numerous schools have prepared traffic policies at the same time, taking advantage of each other's experience.

The effective policies are typically completed within six months and are adopted by the school board. It can also help to ensure a broad sense of ownership if hearings on the traffic policy are held with police, parents, teachers, students, etc.

To ensure the effect of the traffic policy, it is necessary to follow up with specific measures. The greatest effect is achieved through the traditional annual initiatives using thoroughly prepared guides. This may include cyclist tests, school crossing patrols or back to school campaigns.

Some of the less tested initiatives have the greatest effect if the school has a traffic policy. This includes initiatives such as rules and guidance regarding parents' behaviour at the school. It is recommended that schools start with the easy initiatives. Many schools have had success with establishing a network where schools can exchange ideas and experiences with each other. These networks can function optimally if coordinated by the municipality.

The schools in the study found that the policy increases focus on traffic solutions. Furthermore, the schools experienced a better effect from the less traditional traffic measures than the schools without a traffic policy. This especially applies for initiatives that address rules and guidance for parents.²⁴

The city of Grenå provides an example of a multifaceted local effort to promote active transport to school. Here, Vestre School prepared an action plan for students' "self-transport". Furthermore, the school and municipality collaborated to analyse the various roads leading to the school. Grenå Municipality's technical administration prepared a brochure that shows the safe and secure school roads for students, based on the analysis. In co-operation with the municipality and on a trial basis, the school established a car-free area on a stretch of road where students cycle to school. The initiatives have been such a great success that the school had to build more bicycle parking spaces because of the many students who began cycling to school.²⁵

The City of Copenhagen used the World Cup in Road Cycling to bring cycling into the schools. The oldest classes were invited to orienteering races on bicycle, bicycles were purchased for classes and teaching materials were produced.



ORGANISATION AND REALISATION

Things do not happen by themselves, so cooperation and finances are critical factors for a good result.

Cross-disciplinary cooperation

Responsibility for school roads is typically assigned to the municipality's roads department and often with a single person. However, it is important to establish a cross-disciplinary cooperation to get more people to contribute to the task and to ensure the best possible implementation.

The department of schools is a natural partner and can provide contact with the schools' traffic contact teachers. Many school boards can also contribute to the cooperation and solutions. The health department is a partner with a shared interest in getting more children to walk and cycle to school. And the police must (and should) be involved in a close cooperation, both in relation to teaching and the physical projects.

A few annual meetings with the partners can ensure good coordination and improved results.

Financial support

It is optimal to establish a fixed annual municipal pool for ensuring safe school roads. The pool should be linked to the costs incurred by the municipality due to dangerous school roads, so that an increased investment is linked to the saved operating costs.

Since 2009, there has been a national pool in Denmark that provides funding to bicycle projects, including projects for cycling to school and leisure activities. The support provided is currently 40 % and is awarded once each year. Find out more at www.vejsektoren.dk.

It is also possible to apply for EU funding for special projects, but typically not for actual construction. Campaigns and concepts can receive funding and it is possible to establish cooperation with one or two of the nearest neighbours, e.g. Germany, Sweden and Norway (in the case of Denmark). The application process is extensive and typically requires the assistance of a professional consultant.

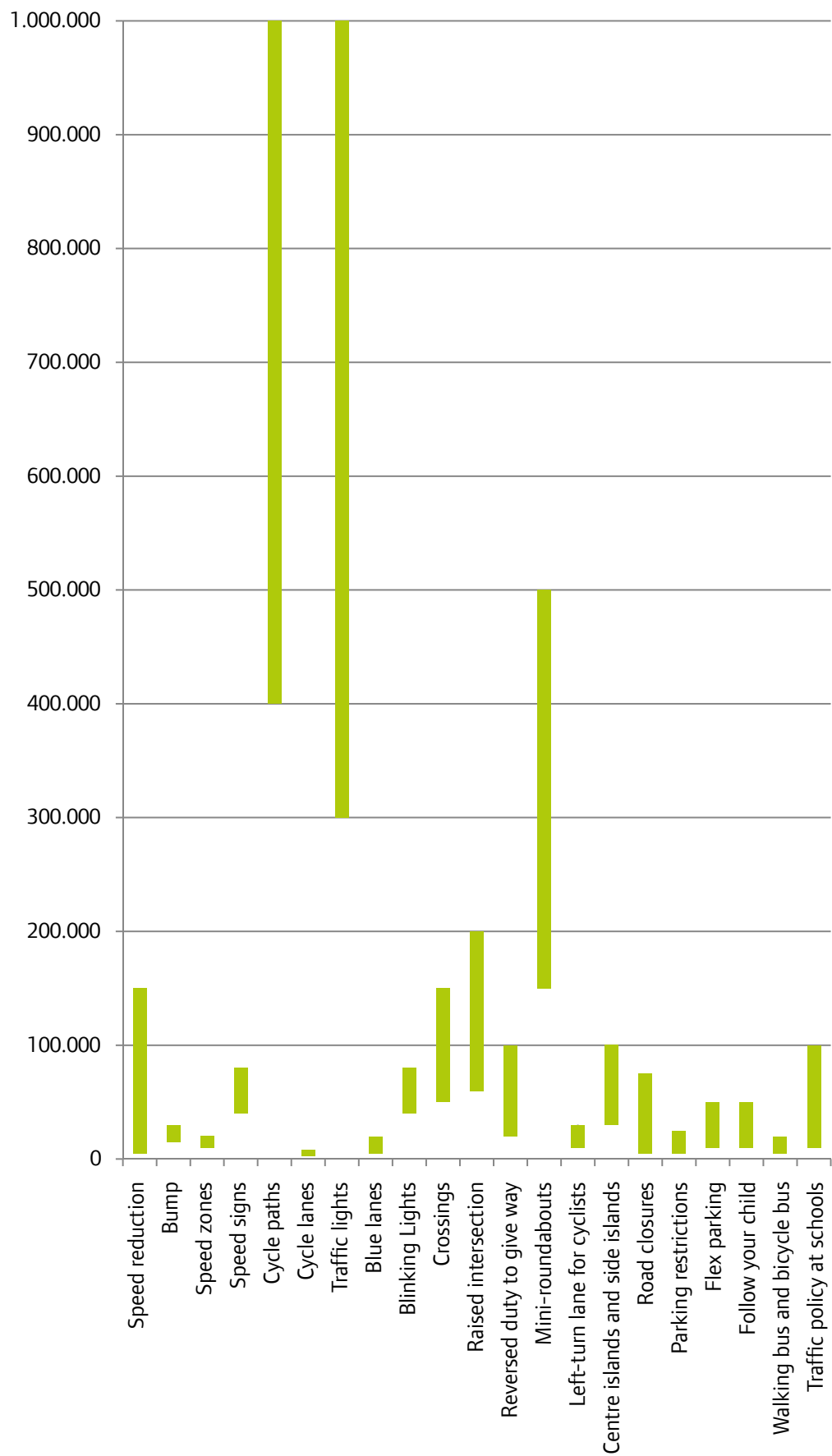
Another possibility is to apply to private foundations, e.g. Tryg-Fonden, which supports traffic safety projects.

Costs

It is important to know the cost of creating good school roads, as the cost must be compared to the benefits gained in terms of health and traffic safety.

The various measures cannot be priced exactly, as it depends greatly on the local conditions and the scope of the project. The following table shows the price levels to be expected under average conditions:

“Things do not happen by themselves,
so cooperation and finances are critical factors
for a good result.”



The respective initiatives have different effects on pedestrians and cyclists. Furthermore, they vary in focus on solving the three main problems:

- Speed
- Crossing difficulties
- Need for simplicity

Schematically, this can be displayed as follows:

Measure	Pedestrians	Cyclists	Speed	Crossing	Simplification
Speed limit	♥	♥	♥	♥	
Bump	♥	♥	♥	♥	
Speed zones	♥	♥	♥	♥	
Speed signs	♥	♥	♥		
Cycle paths and cycle lanes		♥	♥		♥
Traffic lights	♥	♥		♥	♥
Blue lanes		♥		♥	
Blinking Lights	♥			♥	
Crossings	♥	♥	♥	♥	
Raised intersection	♥	♥	♥	♥	
Reversed duty to give way	♥	♥	♥	♥	♥
Mini-roundabouts	♥	♥	♥	♥	
Left-turn lane for cyclists		♥		♥	♥
Centre islands and side islands	♥	♥	♥	♥	♥
Road closures	♥	♥	♥	♥	♥
Parking restrictions	♥	♥		♥	♥
Flex parking	♥	♥			♥
Follow your child	♥	♥		♥	♥
Walking bus and bicycle bus	♥	♥		♥	♥
Traffic policy at schools	♥	♥	♥	♥	♥

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This guide focuses on how municipalities can utilise structural prevention to make cycling the healthiest, safest and easiest mode of transport to and from school.

The guide provides examples of ideas for structural measures that promote active transport to and from school. The measures highlighted are chosen for being realistic and effective. The measures presented do not include very expensive construction projects. On the contrary, many of the solutions are quite inexpensive and can thus be implemented extensively. Safe school roads is a critical prerequisite for enabling more children to travel alone to and from school.

Calculating the health effects of cycling instead of driving shows a reduction in health care costs and greater longevity, which equals great benefits for society and the individual cyclist. Overall, an investment in bicycle-friendly school roads can be recouped within just a few years, as a one-time investment can replace operating expenditures on transport and health.

To ensure that the improvements have the desired effect in relation to new cyclists, it is important that the municipality and school collaborate to communicate these improvements to citizens. Focusing on communications will increase awareness of these issues, making it easier to obtain political support in the future.

It is important that municipalities work across departments to ensure a connection between their ongoing infrastructure projects and the multifaceted interests in healthy children who are able to travel safely to and from school. The greatest possible benefit for citizens is attained by incorporating the wide range of interests into these efforts.

Healthy and active children is an investment that will also have an impact when the children become adults and have children of their own. The physical improvements are permanent and good traffic habits are often passed on to the next generation.

Let's get the wheels in motion!

