

# National Report, Norway

## 1. Statistics (facts, figures and available statistics).

Accident statistics from Statistics Norway (Statistisk Sentralbyrå):

- Table 1 Persons killed or injured in road traffic accidents, by road user group. 1997-2006
- Table 2 Persons killed or injured, by road user group and severity of injury. 1997-2006
- Table 3 Persons killed or injured, by road user group and gender. 1997-2006
- Table 5 Persons killed or injured, by road user group and age. 2006
- Table 6 Persons killed or injured, by road user group, police district and county. 2006
- Table 8 Persons killed or injured in road traffic accidents, by road user group and accident category. 2006

## 2. Publications on Pedestrian Issues

### 1.1 General issues

<b>Author:</b>	Elvik, R., Kolbenstvedt, M. & Stangeby.
<b>Title:</b>	Gå eller sykle? Fakta om omfang, sikkerhet og miljø. TØI 432/1999. Walking or Cycling Facts about Extent, Safety and Environmental Consequences 432/1999
<b>Publication date:</b>	1999
<b>Available from:</b>	Transportøkonomisk institutt, (Institute of Transport Economics) Oslo.
<b>Summary:</b>	
<p>The report was devised as a basis for government efforts to promote cycling in 2000. The report contains much of the material available on walking and cycling in Norway and abroad; the magnitude of this traffic, the risk factor and road safety for pedestrians and cyclists and the environmental benefit to be gained by substituting pedestrian and cycle use for car use. The report shows that in 1998, 6% of all journeys were on foot. The majority of journeys are short (on average 1.8km) and limited in duration (about 20 minutes). People without a car walk most. Pedestrians are four times more likely to be involved in an accident than car drivers.</p> <p>Suggestions to increase the number of people walking for shorter journeys include improved infrastructure and a greater feeling of safety while walking. In conclusion, the report discusses the benefits accrued by increasing the number of pedestrians and cyclists: fewer accidents, better environment for all and better health for the individual.</p>	

<b>Author:</b>	Dahlman, Inge
<b>Title:</b>	Gåboka (The Pedestrian's Handbook)
<b>Publication date:</b>	2005
<b>Available from:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdelingen. NPRA, Directorate of Public Roads, Road Development Department.
<b>Summary:</b>	
<p>The book gives a whole range of views on walking, being a pedestrian and how road and street environments can appear open or closed to pedestrians.</p>	

## 1.2 Travel patterns and traffic behaviour

<b>Author:</b>	Denstadli, J. M. & Hjorthol, R.
<b>Title:</b>	RVU 2001 Den nasjonale reisevaneundersøkelsen, reiser til fots. Norwegian Travel Survey: Walking trips in Norway. TØI 641/2003
<b>Publication date:</b>	2003
<b>Available from:</b>	Transportøkonomisk institutt, (Institute of Transport Economics) Oslo
<b>Summary:</b>	
See RVU 2005	

<b>Author:</b>	Vågane, Liva
<b>Title:</b>	RVU 2005 Den nasjonale reisevaneundersøkelsen, turer til fots og på sykkel. Walking and Cycling. Norwegian Travel Survey. TØI 858/2006
<b>Publication date:</b>	2006
<b>Available from:</b>	Transportøkonomisk institutt, (Institute of Transport Economics) Oslo
<b>Summary</b>	
<p>The Norwegian parliament has agreed to carry out a travel survey every four years. The aim of the survey is to register the travel activities of the population and their travel patterns. Earlier surveys have been done in 1984/85, 1991/92, 1997/98, and 2001. The survey (RVU) in 2005 is divided into the key report and a series of themed reports, including this one, which describes journeys on foot and by bicycle.</p> <p>The report includes information on the extent of the journey, actors, objective, frequency and the possibility of increasing the number of journeys on foot and by bicycle.</p> <p>In the conclusion the report lists the following three main points:</p> <p>In the course of an average day one in three has made a journey on foot, and six per cent have cycled. On average a walking trip is 1.7 km and lasts for 22 minutes. When the walk is not only for its own sake, the distance drops to 0.5km. There is very little difference in the length of trips from 1992 to 2005. On journeys under 900 metres, walkers are in the majority. Women, young people and elderly people are those who walk most. Most pedestrians are to be found in the larger cities. Compared to 1992 the trend is that the elderly walk rather less and the young rather more than before.</p> <p>38 per cent of walking trips are combined with car journeys. It is mainly the elderly who take journeys just on foot. These journeys account for 20% of all journeys.</p> <p>With regard to day-to-day activities, two in five walk every day almost all the way. The proportion of those who walk daily increases with age until it stabilises at around 30-40 years old.</p>	

<b>Author:</b>	Fyhri, A.
<b>Title:</b>	Barns reiser til skolen. En spørreundersøkelse om reisevaner og trafikksikkerhet på skoleveien. Children's journey to school. A questionnaire survey on travel behaviour and traffic safety among children. TI 616/2002
<b>Publication date:</b>	2002
<b>Available from:</b>	Transportøkonomisk institutt (Institute of Transport Economics) Oslo

<b>Summary:</b>	
<p>The aim of the report is to investigate children's journey to school so that transport by car can be reduced.</p> <p>The report shows extensive use of car transport. Even on distances of between a half and one kilometre, 26% of primary school children are driven by parents. Car transport decreases with the increasing age of the child and this transport is used more often in winter than summer. Among the children themselves, a majority of those driven, could imagine walking, while those who already walk are on the whole satisfied with their mode of transport.</p> <p>Parents are more worried about accidents than children. The difference is striking. 55 per cent of parents are slightly or very anxious for their children, while 9 per cent of children think the route to school is dangerous. It is also the parents' anxiety that in many cases decides the children's mode of transport. Anxious parents account for motorised transport in 65 per cent of cases, while the figure for parents that are not anxious is 25 per cent.</p> <p>Car transport is defended in various ways. For journeys under one kilometre, 21 per cent give the reason "lack of time", 17 per cent say "we were going the same way", and the other reasons included; "bad weather", "things to do before school" and "a lot to carry". For shorter journeys, 6 per cent give "dangerous route to school" as a reason, but this reason becomes even more important with longer journeys. The likelihood of being driven is doubled for children whose parents also drive to work themselves. Children's own attitude to cars is also a factor in the mode of transport chosen.</p>	

<b>Author:</b>	Fyhri, A.
<b>Title:</b>	Bruker barn neina? Evaluering av prosjektet Aktive Skolebarn (2002-2005). Do they walk? Evaluation of the project Active way to school (2002-2005). TØI 814/2003
<b>Publication date:</b>	2005
<b>Available from</b>	Transportøkonomisk institutt, 85nstitute of Transport Economics) Oslo
<b>Summary:</b>	
<p>The report evaluates the project "Aktive Skolebarn"/Active School Children. The report compares the results from the survey TØI 616/2002 with new information to see what developments have resulted from the project. The project was implemented to get more children to walk to school; to be active in a safe manner.</p> <p>The survey shows little difference in travel patterns to and from school. 40 per cent are driven (25% private car, 18% pubic transport), while 43 per cent walk to school. However the proportion of children that experience the route to school as unsafe has risen from 9 to 17 per cent from 2002 to 2005. Children themselves think they are knowledgeable about traffic, and this is largely attributed to parents. Parents' attitude to and assessment of traffic is hugely influential for children's journeys and whether they are amenable to other modes of transport than car. In this context campaigns that raise awareness of the issue can have great effect. Children in towns and cities get to school by themselves on the whole compared to children in rural areas.</p>	

<b>Author:</b>	Fyhri, A. & Hjorthol, R.
<b>Title:</b>	Barns fysiske bomiljø, aktiviteter og daglige reiser. Children's physical environment, activities and daily travel. TØI 869/2006
<b>Publication date:</b>	2006
<b>Available from:</b>	Transportøkonomisk institutt, (Institute of Transport Economics) Oslo
<b>Summary:</b>	
<p>The aim of the report is to provide information on children in the age group 6-12; their travel patterns and physical activity. This age group is not covered by the ordinary travel surveys. The report contains information about local games and play opportunities, socialising with and journeys to friends, sport and organised activities, local traffic conditions and school route,</p>	

background to and process of school journey, road safety instruction. With regard to children's travel patterns, the report shows that half of the children live under 1 kilometre from the school and 81% less than three kilometres away. Despite the short distance to school, over 40% of the parents experience the route to school as unsafe because of various traffic conditions. The most usual are heavy traffic, high speeds, lack of traffic separation and pedestrian crossings. The proportion of children driven to school rises with distance they have to travel. Among children who travel less than 500 metres, 12% are driven, though when the distance is between 2 and 3 km the figures rises to 42%. The proportion that cycle is highest for distances between 1 and 2 kilometres. Around 70% have their friends in the immediate neighbourhood and they get to each other on foot. With regard to organised leisure activities, use of a car dominates the picture. 77% participate in some form of organised activity. In general the report shows that children mainly walk or cycle in the summer; older children and boys are more dependent on parents than younger children and girls. Children in towns and cities walk and cycle more than children in the rest of the country.

<b>Author:</b>	Hjørthol, R. & Guro, B.
<b>Title:</b>	Miljøbevissthet og valg av reisemåte. Et pilotprosjekt om forhold mellom miljøholdninger og dagliglivets reiser i to byområder. Environmental awareness and choice of transport mode. A pilot project on the relationship between environmental attitudes and journeys in daily life in two urban areas. TØI 350/1997
<b>Publication date:</b>	1997
<b>Available from:</b>	Transportøkonomisk institutt, (Institute of Transport Economics) Oslo
<b>Summary:</b>	
<p>The aim of the report is to investigate the apparent anomaly between the general environmental interest (attitude) and the rise in the use of the private car (actions). A sample of 120 persons (all with driver's license and real choice) was interviewed. The report shows that half of all journeys had to be made. Half of the car journeys could have been done in a different way, but would have been awkward, uncomfortable or have taken too much time. When the choice they made was to use public transport, the reasons they gave for that choice were much the same. That is to say they perceived the transport as easy, less stressful and a way to avoid parking problems. Pedestrians and cyclists explain their journeys by short distance, good weather and good exercise. Common to all these groups was the absence of the environmental aspect as a reason. A third of all those questioned thought that traffic was the most important environmental issue. Those who use cars as their sole mode of transport think of car traffic as less of an environmental challenge than others. These are also most concerned with traffic jam problems in contrast to public transport users, pedestrians and cyclists who focus more on pollution. Here there is an indication that what is experienced as problematic is to a large extent linked to the individual's transport behaviour and mode of travel more than general knowledge about the activity's impact on the environment</p>	

<b>Author:</b>	Stangeby, I.
<b>Title:</b>	Holdninger til å erstatte korte bilturer med gange eller sykkel. Attitudes to replacing short car trips with walking and cycling. TØI 370/1997
<b>Publication date:</b>	1997
<b>Available from:</b>	Transportøkonomisk institutt (Institute of Transport Economics) Oslo
<b>Summary:</b>	
<p>The report is one of 13 subprojects in the EU project WALCYNG, which discusses attitudes and measures that make it possible to replace short car journeys with walking or cycling. The report divides those travelling into two groups: walkers/cyclists (min. 3 journeys per</p>	

week) and car drivers (mainly car). The report shows that access to transport options is a decisive factor in choice and use. Both groups enjoy walking or cycling but the main division goes between leisure and transport. The barrier for cycling or walking is associated with whether it is awkward or time consuming. The report lists a number of measures to increase the number of journeys on foot or by bicycle:

Physical measures: building more footpath / cycle networks, widening pavements (sidewalks), improving crossings, smoother road surfaces.

Legal, economic and political measures: prohibiting cycling on pavements, car-free city/town centres, priority given to pedestrians and cyclists at crossings, traffic reduction measures such as increasing petrol prices, parking charges and restrictions.

Other measures: facilities to shower and change at the workplace, safe cycle parking.

<b>Author:</b>	Øvstedal, Liv R. & Olaussen, Eirin
<b>Title:</b>	New Means to Promote Pedestrian Traffic in Cities. WP 3: Pedestrian Comfort Synthesis Report. STF22 AO4315
<b>Publication date:</b>	2004
<b>Available from:</b>	SINTEF, Trondheim.
<b>Summary</b>	
<p>The report is one of several subreports in the PROMPT-project (New Means to Promote Pedestrian Traffic in Cities). The aim of the PROMPT project was to develop new tools and solutions for decision makers and town planners to enable them to improve conditions for pedestrians in towns.</p> <p>The aim of this report is to study the welfare of pedestrians in traffic situations. The study was carried out both as a questionnaire and as observation. The report concludes that satisfied pedestrians feel safe and secure in traffic and that this is linked to the traffic conditions, the surroundings and the road's physical condition. Regardless of country, uncertainty linked to other road users, traffic noise, lack of seats, poor lighting and poorly developed infrastructure reduces satisfaction.</p>	

<b>Author:</b>	Øvstedal, Liv R. & Olaussen Eirin
<b>Title:</b>	Registrering av barns atferd på skolevei. SINTEF report STF22 A99556.
<b>Publication date:</b>	1999
<b>Available from:</b>	SINTEF, Trondheim
<b>Summary:</b>	
<p>The aim of the report is to record how children in the age group 6 – 12 behave in traffic. The report shows that there is a high degree of correspondence between the intention of the various traffic measures and the children's actual use of them. Raised pedestrian crossings and call controlled signalling are things which function well. Younger children (up to 7 years old) deviate less from traffic rules than older children. Children between 10 and 12 had developed road user behaviour like that of adult pedestrians. Drivers stop more often for pedestrians accompanied by adults, than when they are walking alone.</p>	

<b>Author:</b>	Øvstedal, Liv R. & Olaussen Ryeng, Eirin
<b>Title:</b>	Who is the Most Pleased Pedestrian? Proceedings of the 3 <sup>rd</sup> International Wlak21 conference, Walk21/Federation of European Pedestrian Associations.
<b>Publication date:</b>	2002
<b>Available from:</b>	
<b>Summary:</b>	
<p>The article presents some results on pedestrians' welfare from the PROMPT-project. The article shows that welfare is linked to walking for leisure in one form or another and that the assessment is rather similar regardless of age, gender and nationality. The lowest satisfaction is to be found in groups of pedestrians who use wheelchairs, wheelwalkers or walking sticks</p>	

and where walking is more characterised by hindrance than other experiences on the road.

### 1.3 Travel patterns and physical design

<b>Author:</b>	Bettum, Ola
<b>Title:</b>	Byens liv. Gaten som social arena. Oslo Urban Life. The street as social arena. Oslo
<b>Publication date:</b>	1998
<b>Available from:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Summary:</b>	
<p>The aim of the report is to provide knowledge about the relationship between the physical form of the urban street and the function of the street as a social and commercial arena. The report is a part of the survey also carried out in Bergen, Trondheim and Hamar. The study is part of the NPRA's work on handbooks and guides on road standards.</p> <p>The survey was done in 1996-97 to register both the quantitative and qualitative characteristics of the street (urban space), observation of actual use (urban activity) and finally interviews to record the aim of and attitude to street use (urban users). The survey demonstrated that the area was dominated by pedestrians and public transport, and there was a significant relationship between public transport interchanges, limited parking facilities and shopping centres. Small differences in summer and winter traffic suggest that most people had a clearly defined objective for their journey and to a lesser extent sought out the area for its social life alone. Crowded pedestrian conditions can be attributed to limited area. This applies particularly to public transport stops where waiting of short duration occurs.</p>	

<b>Author:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department
<b>Title:</b>	Snarvegene, Planlegging i by og tettsted. Brosjyre Short cuts: Planning in urban and built-up areas. Brochure.
<b>Publication date:</b>	2003
<b>Available from:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Summary:</b>	
<p>The brochure points out the function of short cuts and the advantages in relation to the individual and society. This involves increased road safety, better health and environment, experiencing the outdoors and enjoyment.</p>	

### 1.4 Physical design

<b>Author:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Title:</b>	Fra riksveg til gate – erfaringer fra 16 miljøgater. From trunk road to street – experience from 16 environmental streets.

<b>Publication date:</b>	2003
<b>Available from:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Summary:</b>	
<p>The aim of the report is to evaluate 16 road projects where main roads through built up areas are adapted to be environmental streets. One of the main aims in the environmental streets projects is to improve conditions for pedestrians. The report shows that conditions for pedestrians improved on the whole. This can be attributed to better connections between pedestrian areas, better pavements, better adapted crossings and lower speeds throughout for vehicle traffic. It is only where the street is narrow and the speed is low that pedestrians cross the street outside the pedestrian crossings. The majority of pedestrians believe they have better conditions after the rebuilding.</p>	

<b>Author:</b>	Selberg, Knut A.
<b>Title:</b>	Gaten som by- og stedsformer. The street as town and place design.
<b>Publication date:</b>	2002
<b>Available from:</b>	Statens vegvesen. NPRA
<b>Summary:</b>	
<p>The aim of the book is to further develop competence on street architecture and town design by planning and creating roads and streets. The book draws on wide resources and contains topics such as the history of city design, the relationship between areas, roads and streets, design principles and concrete suggestions. The book is copiously illustrated and contains many examples where the significance of the pedestrian as a road user is reinforced.</p>	

## 1.5 Road Safety

<b>Author:</b>	Amundsen, A. H. & Elvik, R.
<b>Title:</b>	Evaluering av hovedvegomlegging i Oslo. Evaluation of new arterial roads in Oslo. Effects on accidents, accident severity and accident patterns. TØI 553/2002
<b>Publication date:</b>	2002
<b>Available from:</b>	Transportøkonomisk institutt, Oslo. Institute Of Transport Economics, Oslo
<b>Summary:</b>	
<p>The aim of the report is to investigate how rerouting four large roads in Oslo have resulted in changes in the number of accidents, severity of injury and type of accident. The report shows that the accident risk generally goes down after rerouting. With regard to the number of accidents, these also go down after improvements but not when new roads are built. It is particularly the number of pedestrian accidents that are reduced. This is directly linked to pedestrians being separated from other road users. Where the main road once ran in the open, it now goes through a tunnel.</p>	

<b>Author:</b>	Bjørnskau, T.
<b>Title:</b>	Risiko i veitrafikken 97/98. Road Traffic Risk in Norway 97/98 TØI 483/2000
<b>Publication date:</b>	2000
<b>Available from:</b>	Transportøkonomisk institutt, Oslo. Institutue of Transport Economics
<b>Summary:</b>	
<p>The aim of the report is to give an overview of the accident risk of various road user groups.</p>	

The report is partly based on the national travel survey 1997/98 and shows changes in relation to RVU 1991/92 (comparable report from 1991/92).  
The accident risk is reduced for pedestrians. The oldest pedestrians are those most at risk.

<b>Author:</b>	Fyhri, A. & Langeland, J. L.
<b>Title:</b>	Fra refleks til russebil. Evaluation of a project aimed at integrating traffic knowledge into the curriculum at local schools. TØI 610/2002
<b>Publication date:</b>	2000
<b>Available from:</b>	Transportøkonomisk institutt, Institute of Transport Economics, Oslo
<b>Summary:</b>	
The report record the results from a project aimed at integrating road safety knowledge throughout the curriculum, from nursery school to upper secondary school. The NPRA and Safe Traffic instigated the project.	

<b>Author:</b>	Glad, A. & Midtland, K.
<b>Title:</b>	Seksåringer og kryssing av veg. Six year old children and crossing of roads. Results of a training experiment TØI 473/2000
<b>Publication date:</b>	2000
<b>Available from:</b>	Transportøkonomisk institutt, Oslo. Institute of Transport Economics
<b>Summary:</b>	
The aim of the report is to document an experiment where 6 year olds were to be trained to find safe places to cross a road. Half of a reference group of 44 children were given theoretical road safety training using a model. Investigations before and after the training showed a significantly greater understanding of traffic among the children in the group who had had the training compared to the rest of the group.	

<b>Author:</b>	Fyhri, A., Bjørnskau, T. & Ulleberg, P.
<b>Title:</b>	En modell for framtiden? Trafikkopplæring av barn ved hjelp av bordmodell. A model for the future? Traffic education for children with a road environment simulation model. TØI 632/2003
<b>Publication date:</b>	2003
<b>Available from:</b>	Transportøkonomisk institutt, Oslo. Institute of Transport Economics.
<b>Summary:</b>	
The aim of the report is to describe a traffic education project where two schools used a table model. The result of the project was that the training had more effect for the pupils in urban schools than for pupils in rural schools.	

<b>Author:</b>	Sagberg, F. & Glad, A.
<b>Title:</b>	Trafikksikkerhet for eldre. Traffic safety for the elderly: Literature study, risk analyses and assessment of safety measures. TØI 440/1999.
<b>Publication date:</b>	1999
<b>Available from:</b>	Transportøkonomisk institutt, Oslo. Institute of Transport Economics.
<b>Summary:</b>	
The aim of the report is to investigate risk factors associated with elderly road users: both	

how far elderly drivers pose a risk to others and how far they are themselves at risk. The report contains information on how the risk of accident increases with age, the likelihood of elderly people being involved in accidents, the link between a lower orientation awareness and changed traffic behaviour and suggestions for preventative measures. The report shows that elderly pedestrians' biggest problem is to cross the road where there is no pedestrian crossing. Elderly pedestrians also have greater problems monitoring two-way traffic than they have with one-way traffic.

<b>Author:</b>	Midtland, K.
<b>Title:</b>	Seks-åringer som fotgjengere – seks-åringers forutsetninger for å ferdes trygt i trafikken og risikofaktorer på skolevegen. Six year olds as pedestrians. Six year olds' background for acting safely in traffic and risk factors on the route to school. TØI 314/1995
<b>Publication date:</b>	1995
<b>Available from:</b>	Transportøkonomisk institutt, Institute of Transport Economics. Oslo
<b>Summary:</b>	
<p>The report was prepared against the background of the school reform for six year olds and aims to find out whether six year olds are able to behave safely in traffic. Furthermore it is discussed whether there is a big difference in the traffic behaviour of six year olds compared to seven year olds.</p> <p>The report shows that children between the ages of 5 and 7 are significantly more likely to be involved in accidents than children 7 and older. This applies particularly to crossing roads. The risk of accident is not first and foremost due to motoric weaknesses or lack of ability to discover or understand danger, it is more a case of not being able to imagine situations, to filter out distractions, analyse significant or less significant elements over time and to be able to generalise from these experiences. Based on this, the report suggests examples of possible measures. Risk of accident is especially high when crossing roads and this situation should therefore be made as straightforward and clear as possible.</p>	

<b>Author:</b>	Mysen, A. B. & Ragnøy, A.
<b>Title:</b>	Analyse av fotgjengerulykker i Oslo . Analysis of pedestrian accidents in Oslo. TØI 368/97
<b>Publication date:</b>	1997
<b>Available from:</b>	Transportøkonomisk institutt, Oslo Institute of Transport Economics
<b>Summary:</b>	
<p>The aim of the report is to record and calculate the risk of pedestrian accidents in Oslo. In addition the accidents to pedestrians aged 6, 7 and 8 years old are analysed.</p> <p>The report shows that the accident figures for the city centre are higher in the evening and at weekends in more characteristically residential areas. Half of all accidents happen in non-designated crossings. With regard to the age groups 6-8, one in three accidents happen in connection with parking of vehicles in the street. It is mainly boys in this age group that are involved in accidents.</p>	

## 1.6 Economic calculation models

<b>Author:</b>	Sælensminde, K.
<b>Title:</b>	Gang- og sykkelvegnett i norske byer. Nytte- kostnadsanalyser inkludert helseeffekter og eksterne kostnader av motorisert vegtrafikk. Footpath and cycle networks in Norwegian towns and cities. Cost-benefit analysis including the health benefits and external

	costs of motorised road traffic. TØI 567/2002
<b>Publication date:</b>	2002
<b>Available from:</b>	Transportøkonomisk institutt, Oslo Institute of Transport Economics
<b>Summary</b>	
<p>The report was made as part of the work on a national cycling strategy commissioned by the Directorate for Health and Social Affairs.</p> <p>The report presents a cost-benefit analysis of combined footpath and cycle networks in the towns of Hokksund, Hamar and Trondheim. The analysis takes into consideration that the transition from car to walking and cycling leads to reduced health costs, reduced external costs such as air pollution and noise from vehicle traffic and reduced parking costs. The results from an extended cost-benefit analysis provide the basis to calculate which social-economic benefits are lost because vehicle traffic in Norwegian towns today hinders people from walking and cycling to the extent they otherwise would have done.</p> <p>The report shows it is socially and economically beneficial to build footpath and cycle networks in example towns and that the investment provides much better social and economic benefits than transport projects in the National Transport Plan (2002-2012). Uncertainty in the basis for calculation has no consequences for benefits, only in the degree of benefit.</p>	

<b>Author:</b>	Nossum, Åse
<b>Title:</b>	Kollektivtilbudet i Osloregionen. Trafikantens verdsetting av tid. Public transport services in the Oslo region. How users value time. TØI 633/2003
<b>Publication date:</b>	2003
<b>Available from:</b>	Transportøkonomisk institutt, Oslo Institute of Transport Economics.
<b>Summary:</b>	
<p>The report aims to give an overview of how users evaluate different phases of journeys on public transport.</p> <p>The part of the report that deals with users time spent going to the transport stop shows differences in pedestrian patterns between a city (Oslo) and a built-up area (Akershus). In the main, journeys are on foot (90% in Oslo and 69% in Akershus). The exception applies to journeys to the train in Akershus where only 54% of passengers go on foot.</p>	

<b>Author:</b>	Sælensminde, K. & Elvik, R.
<b>Title:</b>	Prioriteringsverktøy for gang- og sykkeltiltak – premisser og veiledning. A method for setting priorities for measures designed for pedestrians and cyclists – criteria and guidelines. TØI 479/2000
<b>Publication date:</b>	2000
<b>Available from:</b>	Transportøkonomisk institutt, Oslo Institute of Transport Economics
<b>Summary:</b>	
<p>The aim of the report is to describe a project set in motion by Vegdirektoratet/Directorate of Public Roads to develop a points based tool for setting priorities(PBV) intended to be used in connection with foot and cycle paths. The tool should be less demanding in terms of resources than standard cost-benefit analyses. The report describes the method, priorities, uncertainties and deficiencies..</p>	

<b>Author:</b>	Elvik, R.
<b>Title:</b>	Cost-Benefit Analysis of Safety Measures for Vulnerable and inexperienced Road Users. TØI 435/99
<b>Publication date:</b>	1999

<b>Available from:</b>	Transportøkonomisk institutt, Oslo Institute of Transport Economics
<b>Summary:</b>	
The report constitutes part 5 of the EU project PROMISING where the aim is to investigate road safety measures for vulnerable road users (pedestrians, cyclists, moped riders, motorcyclists) and inexperienced drivers. The report gives cost-benefit analyses of road safety measures and discusses use and possibilities to generalise the results across countries.	

### 3. Current Research projects

#### 1.7 SINTEF Byggforsk The Norwegian Institute of Research on Building and Infrastructure.

Universal design and social and economic benefits. Commissioned by:  
Husbanken/Norwegian State Housing Bank.

Aim: to investigate the social and economic benefits through universal design by setting some universal design requirements in new housing projects.

### 4. Policy Statements

Recommendations for design of footpath networks:

<b>Author:</b>	Staten vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Title:</b>	Håndbok 017. Veg- og gateutforming Handbook 017 Road and street Design
<b>Publication date:</b>	1992 (under revision)
<b>Available from:</b>	Statens vegvesen, Vegdirektoratet, utbyggingsavdeling. NPRA, Directorate of Public Roads, Road Development Department.
<b>Summary:</b>	
Handbook 017 is the NPRA's standard for design of roads and streets. The handbook is based on a road hierarchy where the function (main roads, mixed traffic roads and access streets) is combined with the character of the area (scattered, relatively built-up, built-up). The handbook contains detailed recommendations on the actual design of for example footways, crossings and footpaths.	

<b>Author:</b>	Byggforsk/ The Norwegian Institute of research on building and infrastructure
<b>Title:</b>	Blad 220.300 Universell utforming, utforming som passer alle. Universal design: design that suits everyone.
<b>Publication date:</b>	1992 (under revision)
<b>Available from:</b>	The Norwegian Institute of Research on Building and Infrastructure SINTEF
<b>Summary:</b>	
The document considers principles and philosophy behind the concept of universal design. It shows how the principles form the basis for design of houses and there are suggestions for dimensions and measures for the building and outdoor areas.	

<b>Author:</b>	Sakshaug, Kristian & Tveit, Ørjan
<b>Title:</b>	Plassering og sikring av kryssingssteder for gående. Beskrivelse av tiltak og forslag til

	kriterier for anvendelse av disse. Placement and design of safe crossings for pedestrians – a guideline. STF22 A04329
<b>Publication date:</b>	2004
<b>Available from:</b>	SINTEF, Trondheim
<b>Summary:</b>	
The report aims to give a comprehensive picture of suggestions for criteria for the choice of type, placement and design of crossings for pedestrians. This includes physical measures such as light marking of the road and pedestrian crossing, stronger street lighting, guardrails, signals and grade separated crossings. The safety of pedestrians has been the basis for these proposals.	

<b>Author:</b>	Øvstedal, Liv R., Lindland, Terje % Stene, Trine Marie
<b>Title:</b>	Revisjon av håndboken 017 veg- og gateutforming. Univerell utforming, tilrettelegging for ulike brukergrupper. Revision og Handbook 017. Road and Street Design. Universal design, adapting to different user groups. STF22 A04327
<b>Publication date:</b>	2005
<b>Available from:</b>	SINTEF, Trondheim
<b>Summary:</b>	
The report aims to provide contributions to NPRA's revision of Handbook 017. Analyses have been done for the theme of "Basis for dimensions" and there are assessments of the physical design in connection with pedestrians, public transport and motorists.	

<b>Author</b>	Øvstedal, Liv R. & Lindland, Terje.
<b>Title:</b>	Ledelinjer gategrunn, Rapport 2 Tactile guidelines on pavements – Norwegian and European experiences. STF50 A05004
<b>Publication date:</b>	2005
<b>Available from:</b>	SINTEF, Trondheim
<b>Summary:</b>	
The report aims to give recommendations on the design of tactile guidelines for blind and visually impaired people on roads and streets. The report is a continuation of an earlier investigation into how tactile guidelines are used in different countries. The report contains concrete proposals for the use of tactile guidelines. The guidelines make it easier for blind and visually impaired people to move around outdoors and find their way in streets. The recommended solutions contribute to the national requirement for tactile, optical and acoustic contrast, but at the same time allows for choice of different materials and colours. The guidelines are divided into three indicator groups: direction indicators, attention indicators and warning indicators.	

## 5. The legal position of pedestrians

1.8 LOV 1965-06-18 nr. 04: Vegtrafikklov/ the Law on Road Traffic

1.8.1 FOR 1986-03-21 nr 747: Forskrift om kjørende og gående trafikk (trafikkregler) / Regulations for pedestrian and motor vehicle traffic (Traffic rules)

§ 1. Definitions

- a) Road: any public or private way, street, square (including storage yards, parking places, stopping places, bridges, winter roads except for marked routes for snow scooters, ferry quays or other quays directly connected to a road) which is open to regular traffic.
- f) Footpath and cycle path: any path for pedestrians, cyclists or combined pedestrian and bicycle traffic, which is indicated by an official traffic sign. The path is separated from the carriageway by a strip of grass, ditch, fence, kerbstone or by other means.
- h) Pavement: any paved strip reserved for pedestrians, which is separated from the carriageway by a kerbstone.

### **§ Scope of the rules**

3. Pedestrians include those who:

- a) are on skis or roller skis
- b) are propelling wheelchairs or sledges or chair sledges
- c) are wheeling cycles or mopeds, pushing prams or using toy vehicles.

### **§ 3. Instructions**

Special traffic light signals for traffic in lanes for public transport, cyclists or pedestrians apply only to traffic in that special lane and take precedence over other traffic light signals.

### **§ 4. Use of the carriageway**

1. Motor vehicles shall use the carriageway. It is prohibited to drive on footpaths, pavements or pedestrian lanes.

### **§ 7. Obligation to give way (yield)**

- 3. A driver who intends to turn shall give way to pedestrians or cyclists on the road being entered.
- 4. A driver entering or crossing a road from a cycle path, pedestrian way or footpath shall give way to other road users already on the road.

### **§ 9. Special obligations towards pedestrians**

- 1. Drivers shall allow pedestrians adequate space on the road.
- 2. When crossing a footpath, pavement or pedestrian lane, a driver shall give way to pedestrians. The same applies to driving in pedestrian streets or residential areas (pedestrian precincts). At pedestrian crossings where the traffic is not regulated by a police officer or a traffic light signal, drivers shall give way to pedestrians already using or about to use the crossing.
- 3. Drivers who intend to overtake a tram or bus on the right at a stopping place without a traffic island shall stop and make way for passengers alighting or boarding. The same applies to cyclists who overtake on the right of a bus at a stopping place.
- 4. Drivers shall avoid stopping on pedestrian crossings. This shall also apply to tram drivers.

### **§ 12. Overtaking**

6. Drivers who are approaching a pedestrian crossing must not overtake another vehicle or tram, which obstructs any part of the driver's view of the pedestrian crossing.

### **§ Special regulations regarding driving speed**

2. A driver is under special obligation to proceed at a slow enough speed and, if necessary, stop at once when passing:

- a) children on or near the road,
- b) school patrols,
- c) pedestrians carrying a white cane to indicate they are blind or accompanied by a guide dog,
- d) other pedestrians who may be assumed to suffer from a disability or an illness which hinders them in traffic.
- e) trams or buses which have stopped or are about to stop at a tram or bus stop.

3. Vehicles must not be driven faster than at walking pace in pedestrian streets or residential areas/pedestrian precincts.

### **§ 17. Stopping and parking**

1. It is prohibited to stop:

- c) partly or wholly in pedestrian lanes, on pavements, footpaths, cycle paths or cycle lanes,
- d) on pedestrian or cycle crossings or less than 5 metres from such areas.

2. It is prohibited to park:

- c) on pedestrian streets,
- d) in pedestrian precincts other than in specially marked places.

### **§ 18. Special regulations governing cyclists**

3. Cycling on pedestrian crossings, pavements, pedestrian lanes or footpaths is allowed when there is little pedestrian traffic, and cycling does not endanger pedestrians or cause a hindrance to pedestrians. Cyclists passing pedestrians in such places must give pedestrians plenty of space and pass at approximately walking pace.

4. Cycles may stop or park on cycle lanes, pedestrian lanes, pavements, pedestrian streets or pedestrian precincts as long as they do not present an unnecessary hindrance or disadvantage.

### **§ 19. Special regulations governing pedestrians**

1. Pedestrians shall use the pavement, footpath, pedestrian lane or verge of the road. If this is impossible or unreasonable due to the speed of the traffic, pedestrians may use cycle paths, cycle lanes or the carriageway.

A pedestrian using the carriageway shall keep as far to the left as possible in the direction in which s/he is walking, but all the way to the right when wheeling a bicycle. Where otherwise necessitated by special circumstances or risk of danger, pedestrians may use the opposite side.

2. A pedestrian crossing a carriageway shall use a pedestrian crossing, footbridge or underpass, whenever there is one nearby. Elsewhere the pedestrian shall walk straight across the carriageway, preferably at an intersection.

Before crossing the carriageway outside a pedestrian crossing, a pedestrian shall make sure that s/he does not endanger or in any other way disturb or inconvenience any other road user.

### **1.8.2. Regulations 2005-10-07 no. 1219 Regulations on official traffic signs, road marking, traffic light signals and directions (sign regulations)**

## Chapter 2. Danger signs

### § 4. The individual danger signs

140	140 Distance to pedestrian crossing
142	142 Children The sign warns of a place on or along the road where children often go or are to be found in connection with school, nursery, play area etc.
154	154 Skiers The sign warns of a place where skiers often cross the road.

## Chapter 4. Prohibited signs

### § 8. The individual prohibited signs

306.7	306.7 Prohibited for pedestrians
306.8	306.8 Prohibited for pedestrians and cyclists

## Chapter 6. Information signs

### §12. The individual information signs

516	516 Pedestrian crossing Sign indicates crossing for pedestrians where the traffic rules on pedestrian crossings apply.
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518	<p>518 Footpath</p> <p>The sign indicates a path for pedestrians. The sign also indicates that traffic rules governing such paths apply here..</p>
522	<p>522 Combined pedestrian and cycle path</p> <p>The sign indicates a path for pedestrians and cyclists. The sign also indicates that traffic rules governing such paths apply here.</p>
540	<p>540 Pedestrian precinct</p> <p>The sign shows the limits for the area where the traffic rules governing such precincts apply. Hindrances are not specially marked or warnings given. This applies up to the point where it ends at sign 542, "End of pedestrian precinct".</p>
542	<p>542 End of pedestrian precinct</p>
548	<p>548 Pedestrian street</p> <p>The sign indicates the area where it is prohibited to drive a motor vehicle and where the traffic rules governing pedestrian streets apply. The sign indicates rules are in force until ended by sign 550 "End of pedestrian street".</p>
550	<p>550 End of pedestrian street</p>

### Chapter 8. Direction signs

#### § 16. The individual directional signs

749	<p>749 Direction sign for pedestrian traffic</p> <p>The sign can show the symbol for those with disability</p>
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### Chapter 11. Road markings

#### § 22. The individual lines and symbols

1024	<p>1024 Pedestrian crossing</p> <p>The markings indicate that the traffic rules governing pedestrian crossings apply even though the sign 516 "Pedestrian crossing" has not been erected.</p>
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1037	1037 Pedestrian symbol
1042	1042 Symbol to indicate those with disability

## Chapter 12. Traffic light signals and instructions given by police officers

### § 24. The individual signals

1086	<p>1086 Pedestrian lights</p> <p>The red light means that pedestrians must not begin to cross the carriageway if this may hinder drivers or pose a danger. Pedestrians who have already started to cross, can continue. A green light means that pedestrians can cross the carriageway. A blinking green light means the light is about to change to red and should be adhered to as if it were a red light.</p>
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## 1.9 Lov 1985-06-14 nr 77: The Planning and Building Act of 1985 (Plan- og bygningslov)

### 1.9.1 1997-01-22-33: Regulations on requirements for building and products used in building.

#### Chapter X Use

##### § Access to buildings

Access from road to main entrance, including entrance area, shall be easy to find, easy to use, should be free of hindrances and adapted for people with disabilities for:

- buildings with a common entrance for more than 4 living units.
- building which is a workplace
- buildings open to the public

##### Public access routes

##### § 10-5 general requirements to public access

The regulations in this chapter shall ensure good and safe public access where there are different levels at the entrance to a building or inside a building. These regulations apply in the same way to other buildings.

Access routes shall be designed so that they are suitable with regard to the movement and transport that will occur there. They shall be designed so that they can be used by disabled people. Where it is required, public access routes shall be adapted for use by disabled people. Where there is a difference in level, the gradient should be reasonable and there should be sturdy handrails on both sides. Handrails should provide a good grip. Where the difference in level necessitates adaptation for disabled people, it must be designed so that a wheelchair user can use handrails on both sides.

##### § 10-51 Stairs

Stairs should be easy to use and have an even gradient with a good handrail on both sides. The breadth and height of each step shall be as far as possible equal for the whole length of the stairs. On curving stairs, the breadth of the step, even on the inside edge shall be comfortable enough to climb. The width of the stairs shall be according to the whole design of the stairs and the kind of transport expected to occur on the stairs. A main staircase to a unit, as well as stairs in each part of the unit that are the sole entrance to a floor, shall be adapted so that transporting of moving goods and transport in cases of illness shall be possible. Stairs that form part of an emergency escape route shall be wide enough to accommodate effective evacuation/escape, see § 7-27. Main stairs shall run straight. These stairs shall have sufficient flat resting areas to accommodate disabled people and have good handrails at two different heights on both sides.

§ 10-52 Ramps shall be designed to be practical in relation to the transport and movement expected to occur there. Ramps to be used by disabled people shall not have a steeper gradient than is easy to use by a wheelchair user. Such ramps should be designed to have sufficient flat rest areas adapted to the needs of disabled people and have good handrails at two different heights on both sides.

### **1.9.2 1995-09-20 no. 4146: National policy guidelines to promote the interests of children and adolescents in planning**

1. National objectives for conditions for children and adolescents. Important national aims are:

- To ensure that children and adolescents grow up safe from physical injury and psychological damage, and that they have physical, social and cultural qualities at all times in accordance with current knowledge on the needs of children and adolescents.
- To maintain public responsibility for ensuring that children and adolescents get the facilities and opportunities that can challenge the individual and provide a meaningful childhood and adolescence regardless of home, social and cultural background.

2. Intention of the National Policy Guidelines to strengthen children's and adolescents' interest in planning

The intention of these National Policy Guidelines is to:

- Strengthen and make obvious children's and adolescents' interest in planning and building cases according to the Law on Planning and Building.
- Give municipalities a better basis for integrating and ensuring children's and adolescents' interests in processing planning and building cases.
- Provide a basis for assessing cases where children's and adolescents' interests come into conflict with other interests or considerations.

3. 4. Requirements in municipal planning

The municipality shall:

- Assess the consequences for children and adolescents in planning and building cases in accordance with the Law on Planning and Building.
- Make a considered assessment of the conditions for children and adolescents growing up and integrate aims and measures into municipal planning.
- Create guidelines, rules or regulations on the extent and quality of areas and facilities of significance for children and adolescents, which will be incorporated in plans affecting children and adolescents.
- Organise the planning process so that views relevant for children that are affected come to light and that various groups of children and adolescents are themselves given the opportunity to participate.

5. Physical design requirements

The following shall be given special considerations:

- Areas and facilities that will be used by children and adolescents shall be protected against pollution, noise, traffic dangers and other health hazards.
- In the local environment there shall be areas where children can express themselves and create their own play environment. This presupposes that the areas are big enough and are; suitable for play and leisure, provide opportunities for various types of play throughout the year, can be used by different age groups, and provide opportunities for children, adolescents and adults to interact.

d. When change of use applies to areas that in the plans are set aside for common areas or playing fields or that are used for or suitable for playing, these shall be fully compensated for by the provision of similar facilities. Substitutes shall also be found when building on or using areas children use as play areas, or where change of use of areas suitable for play does not accord to the requirements stated in b above.

### **1.9.3 1993-08-20-817 National Policy Guidelines for Coordinated Land and Transport Planning**

3.1 Planning the pattern of building and transport system should be coordinated so that conditions prevail for the most effective, safest and environmentally friendly transport and so that transport needs can be limited. There should be emphasis on achieving conditions that can provide short distances in relation to daily activities and efficient coordination of different modes of transport.

3.3 The pattern of building development and transport system should be designed so as to avoid change of use of large adjoining areas of cultivated or cultivatable land of high quality. Within walking distance of stations and transport interchanges on the main arteries of the public transport system, development requirements can be given more emphasis than conservation, providing that a concentrated development is planned and that it takes into consideration the cultural environment and green areas.

3.5 Emphasis shall be given in the planning process to pedestrians and disabled people.

## **6. Best Practices**

## **7. Innovations**

## **8. General Attitudes**

Traffic in Norway is regulated by traffic rules, and road users' behaviour is to a large extent a consequence of these. The general attitude to pedestrians is good. At pedestrian crossings, it is expected that motorists stop and allow pedestrians to cross, while pedestrians for their part are aware that motorists need time and give clear signals when they intend to cross. All traffic injuries shall be reported to the police.

In built-up areas where the pavement is used by cyclists and pedestrians, slight conflicts can arise. Cyclists can use the pavement on the pedestrians' terms, but in practice this is often quite the opposite. Over time this becomes a source of irritation, which can affect the general relationship between cyclists and pedestrians. Factors such as trees, signs, rubbish bins, and advertising boards make pavements more precarious and demand more care from the individual pedestrian, and increase the chance of conflict among pedestrians and between pedestrians and cyclists.

In political debates on roads and traffic, consideration for the pedestrian takes second place to concerns about traffic flow.