TRAFIKVERKET

Analysis of road safety trends 2022

Management by objectives for road safety work towards the 2030 interim targets

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Foreword

This report is the second annual follow-up of the progress towards the 2030 road safety objectives. It describes and analyses road safety trends in 2022. As in previous years, results are analysed in terms of the number of fatalities as well as a series of road safety performance indicators. The number of seriously injured is not reported for 2022.

The report was produced by a group of analysts from the Swedish Transport Agency, the Swedish National Road and Transport Research Institute (VTI) and the Swedish Transport Administration. The following analysts contributed to the report: Khabat Amin (Swedish Transport Agency), Åsa Forsman and Anna Vadeby (VTI), and AnnaLena Elmqvist, Rikard Fredriksson, Per Hurtig, Peter Larsson, Magnus Lindholm, Matteo Rizzi, Simon Sternlund and Kenneth Svensson (Swedish Transport Administration).


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Summary

Swedish road safety work is based on Vision Zero and designated interim targets to track progress towards its achievement. The current interim target for road safety is to halve the number of fatalities from 266 (the average annual number 20172019) to a maximum of 133 fatalities in 2030. The interim target also specifies that the number of seriously injured on the roads is to be reduced by 25 per cent from a corresponding number. This report describes and analyses current road safety trends in terms of road safety performance indicators and the numbers of fatalities. The number of seriously injured is not reported, as a new method for non-response compensation of the number of seriously injured is being developed in 2023. In addition to the adopted national interim targets there is also an interim target at the EU level that specifies a halving, by 2030, of the number of fatalities recorded in 2019.

Outcome indicators

Indicator	Description	Starting point (average 2017–2019)	2022	Target 2030
Number of fatalities	Number of fatalities in road traffic accidents	266	227	133
Number of seriously injured	Number of seriously injured in road traffic accidents	Will be computed in 2023		Reduce by 25 %
Number of seriously injured in pedestrian falls	Number of seriously injured in pedestrian falls (not included in the definition of a road traffic accident)	Will be computed in 2023		Reduce by 25 %
Number of suicides in the road transport sector	Number of suicides in the road transport sector, including the number jumping off bridges (not included in the definition of a road traffic accident)	52	Not established	Reduce
Number of seriously injured in single-bicycle accidents	Number of seriously injured in single-bicycle accidents	Will be computed in 2023		Reduce by 25 %

System indicators

Indicator	Description	Starting point 2020	2022	Necessary level 2030
Safer roads, national road network	Share of traffic volume on roads with median barriers, national roads with speed limits 90–120 km/h	85 %	86 %	96 %
Safer roads, national road network	Share of traffic volume on roads with median barriers, national roads with speed limits 80–120 km/h	64 %	65 %	70 %
Safer intersections, national road network	Share of annual average daily traffic with *very good* or *good* road safety classifications	–	74 %	85 %
Safer intersections, national road network	Share of annual average daily traffic with *very good*, *good* or *fair* road safety classifications	–	91 %	99 %

System indicators

Indicator	Description	Starting point 2020	2022	Necessary level 2030
Safer pedestrian, bicycle and moped crossings, national road network	Share of pedestrian, bicycle and moped crossings of *good* or *fair* safety classifications	60 %	61 %	80 %
Safer pedestrian, bicycle and moped crossings, municipal road network	Share of pedestrian, bicycle and moped crossings of *good* or *fair* safety classifications	50 %	52 %	75 %
Safer streets in urban areas	Share of street length with 30 and 40 km/h speed limits of all streets with 30, 40 or 50 km/h speed limits	65 %	69 %	99 %
Safer vehicles	Share of new cars sold with 5 stars in a Euro NCAP test	89 %	86 %	90 %
Systematic measures for safe pedestrian and cycle traffic	Survey of selected municipalities, share of municipalities with a high level	15 % (2021)	15 % (2021)	70 %
Suicide-preventive road design	Suicide barriers on high bridges near urban areas	–	–	50 % of those indicated
	Access barriers on busy roads near urban areas	–	–	50 % of those indicated
	Viaducts across busy roads near urban areas	–	–	25 % of those indicated

Use indicators

Indicator	Description	Starting point 2020	2022	Necessary level 2030
Compliance with speed limits, national road network	Share of traffic within speed limits	49 %	53,9 %	80 %
Compliance with speed limits, municipal road network	Share of traffic within speed limits	67 %	63 % (2021)	80 %
Sober drivers	Share of traffic volume with sober drivers	Ej fastställt	–	99,9 %
Seat belt use	Share of passenger car occupants observed using a seat belt	97,9 %	95,7 % (2021)	99,5 %
Helmet use, cyclists	Share of cyclists observed wearing a helmet	47 %	46 % (2021)	80 %
Helmet use, moped riders	Share of moped riders observed wearing a helmet	98 %	98 % (2021)	100 %

227 people died in road traffic accidents during 2022. That is an increase compared with 2021, when there were 210 fatalities. This outcome is 7.5 per cent higher than the level required to be on track with the necessary trend (a maximum of 211 fatalities in 2022) towards the 2030 interim target.

We are unable to assess, on the basis of the outcome in 2022, if it will be possible to attain the 2030 interim target for fatalities, but we can nevertheless note that extensive measures will be required during the remaining period in order to attain the interim target. A number of the indicators show a positive trend, but we still have to note that taken together, the indicators are not in line with the required trend towards 2030.

Two additional targets have been set as part of the Swedish Transport Administration's stakeholder coordination of overall road safety efforts: the number of suicides in the road transport sector, including jumping off bridges, is to be reduced between 2020 and 2030; and the number of seriously injured in falls occurring within road traffic is to be reduced by 25 per cent over the same period. In 2022 there were 36 suicides within road traffic; the number of fatalities from jumping off bridges had not been established at this report's publication.

Increased compliance with speed limits, leading to lower speeds overall, is estimated to be the area with the greatest potential for reducing the number of fatalities. Levels of compliance have remained fairly unchanged for long period of time, but have shown a gradual improvement since 2018. The share of traffic driving within the speed limit in 2022 was approximately 54 per cent, which can be compared with approximately 45 per cent in 2018.

Over the same period, average travel speed has decreased from just over 78 km/h to just over 75 km/h. Despite this increased compliance, the necessary level of 80 per cent compliance with speed limits by 2030 remains a long way off.

Speed limits adapted to roads' safety standards, and continuing installation of median barriers are of the greatest importance for attaining the interim targets by 2030. A 2022 review of speed adaptations was intended to be completed by 2025. It is now expected to take until 2030 to complete, and will give greater weight to increased mobility. No adaptations of speed limits to roads' safety standards were implemented in 2021–2022, and 140 km of road had median barriers installed. In urban areas a new base speed limit of 40 km/h is a fundamental condition for achieving a safe urban environment, and 30 km/h needs to be implemented in urban areas where vulnerable road users coexist with car traffic in a regular and planned way. In 2022 the proportion of roads in urban areas with 30–40 km/h speed limits was around 70 per cent.

Another indicator of considerable significance is safe passenger cars. Of all cars registered for the first time in 2022, around 86 per cent had the highest Euro NCAP safety rating. However, requirements for the top rating will gradually be raised between 2020 and 2030, meaning that a five-star car in 2030 will offer considerably greater safety than a five-star car in 2020. As a rule of thumb, it takes up to 30 years from the introduction of a new safety system for it to provide the maximum benefit on the roads. It is therefore important that all new cars sold have all the available safety equipment, which can be encouraged through legislation as well as through Euro NCAP, whose test protocols are continually updated.

A quarter of all road traffic fatalities are the result of an alcohol or drugs-related accident. In order to attain the 2030 interim targets, 99.9 per cent of traffic has to be by sober drivers. Police enforcement is important, and in the longer term it will be necessary to have technical systems in cars that prevent persons under the influence of alcohol or drugs from driving them. The number of breath tests decreased sharply during the pandemic, and was only just under 1 million in 2022.

It is currently too early to assess if it will be possible to attain the interim target for the number of fatalities by 2030, but we can nevertheless note that it will take extensive measures during the period in order to get there. What we can also note, however, is that the management by objectives model with indicators is an effective tool for guiding road safety towards a road transport system that is adapted to human levels of tolerance of external violence.

Introduction

Swedish road safety work sets out from Vision Zero and the interim targets defined for achieving that vision. In 2020 the government adopted a new transport policy interim target for road safety which states that the number of fatalities in road traffic accidents is to be halved and the number of seriously injured reduced by at least 25 per cent by 2030.

In simplified terms, the trend for the number of fatalities and seriously injured in road traffic can be said to depend on three factors:

1. **Systematic road** safety work in the form of safer roads, safer vehicles, regulations and legislation, improved training of road users, expanded enforcement etc.

2. **External factors** that are not affected by systematic road safety work but which affect the road transport system, including changes in the economic outlook, traffic increases, demographic changes and weather variations.

3. **Random variation** that depends on the size of the group in question. Random variation is less significant for the number of injured since this group is relatively large, but for the number of fatalities it may be as high as 15 per cent.

Road safety work in Sweden is carried out in a systematic way using a management by objectives model. The fundamental idea is that the interim target for 2030 will be attained through this systematic work. The model involves measuring and tracking a series of current conditions in the road traffic system which have a verified relationship with the trend for the numbers of fatalities and seriously injured on the roads. These conditions are measured using what are known as road safety performance indicators. For each indicator, a necessary level by 2030 is defined. Taken together, these necessary levels are estimated to lead to the attainment of the 2030 interim target for the number of fatalities and seriously injured. The levels have been obtained by using an analysis model based on the Swedish Transport Administration's in-depth studies and the Strada accident database.

The outcome in terms of fatalities and seriously injured, and of the road safety performance indicators, are followed up and analysed every year in order to track trends towards 2030. The analysis is then presented at annual results conferences where various stakeholders participate.

2030 targets

In 2020 the government adopted a new road safety interim target, for 2030. It calls for halving the number of fatalities in road traffic accidents, from 266 (the average number 2017–2019) to no more than 133 fatalities by 2030. For seriously injured in road traffic accidents the target was set at a reduction by at least 25 per cent.

In addition to the national interim targets adopted, there is also a target set at the EU level for reaching close to zero fatalities in road traffic by 2050, as well as an interim target for 2030 which calls for halving the number of fatalities compared with the 2019 figure. Two additional targets have also been set as part of the Swedish Transport Administration's stakeholder coordination of overall road safety work, and these should be tracked in the same systematic manner as the government's interim targets:

- The number of suicides in the road transport sector, including jumping off bridges, to be reduced between 2020 and 2030.

- The number of seriously injured in pedestrian falls occurring within road traffic to be reduced by 25 per cent between 2020 and 2030.

Road safety performance indicators

In an earlier project the Swedish Transport Administration used a goals-based planning strategy, also known as backcasting, for the purpose of describing a safe system with almost zero fatalities in 2050. The following step involved developing a scenario for 2030 with the aim of focusing on fatalities and serious injuries in such a way that the 2030 interim target is attained at the same time as systematic progress is made towards the safe system in 2050 (Memorandum: Prognos av trafiksäkerhetsutvecklingen och scenarier för att nå målnivåer 2030 och 2050, TRV 2021/72599, or "Road safety trends forecast and scenarios for attaining target levels in 2030 and 2050").

The principal outcome of this project can be summarised as follows:

- Planned road measures and future vehicle developments will not be enough to attain the 2030 targets with certainty. It is important to underline that future vehicle technology holds great potential, but the greatest benefit will be reaped after 2030.
- Additional measures will be needed in order to attain the 2030 targets for the number of fatalities and seriously injured. The project presented a proposal for investments between 2020 and 2030 in order to enable attaining the 2030 interim target, while at the same time making systematic progress towards the safe system in 2050.
- Despite ambitious plans for road measures, compliance with speed limits is the crucial factor for attaining the 2030 targets, in particular if we assume that traffic volumes will continue to increase until 2030.
- There is a clear need for new road safety measures focused particularly on serious injuries among vulnerable road users.

Indicators in national road safety work must fulfil the following requirements:

1. The indicator must possess verified validity, meaning there must be an established relationship between changes to the indicator and the number of fatalities and/or seriously injured.
2. The indicator must be reliable. It must be possible to measure it and follow it up in the same way every year. It is more important that the indicator is reliable – and is measured consistently – than that it is measured in a way that is fully representative of the entire country.
3. The indicator must be easy to measure, so that measurements do not become too extensive, resource-demanding and complicated.
4. Indicators should remain the same from year to year, so that the trend for individual indicators can be tracked continuously.

The project led to a revision of road safety performance indicators and necessary outcomes in order to attain the 2030 targets. These revisions can be divided into three groups as follows:

- Outcome indicators: for following up the outcomes in road traffic, e.g. the number of fatalities and seriously injured.
- System indicators: for following up the design of the road transport system at the system level, e.g. safe roads and safe vehicles.
- Use indicators: for following up the use of the road transport system, e.g. compliance with speed limits and seat belt use.

Outcome indicators

The outcome indicators track outcomes in road traffic, i.e. the number of fatalities and seriously injured.

According to the definition in official statistics, a road traffic accident is ”an accident having occurred in traffic on a road generally used for traffic with motor vehicles, in which at least one moving vehicle was involved and which caused personal injury”. Pedestrians killed or injured as a result of falls in road traffic are therefore not included in official statistics on road traffic accidents causing personal injury. A person who dies within 30 days of a road traffic accident, as a result of that accident, is considered a road traffic accident fatality for statistical purposes.

Suicides are not included in official statistics. The figures presented below tracking progress towards the 2030 interim target thus do not include suicides.

The source for figures on fatalities and seriously injured on the roads is Strada, the Swedish Transport Agency’s information system on road traffic accidents causing personal injury, which in turn relies on data from the police and emergency hospitals.

Number of fatalities

	Starting point (2017–2019 average)	2022	Necessary level 2030	Assessed progress towards necessary level
Number of fatalities	266	227	133	Not on track

In the spring of 2020, the government defined a new interim target for road safety trends: the number of fatalities is to be halved to a maximum of 133 by 2030. The target level is based on the average annual number of fatalities 2017–2019. In addition to this national target there is an interim target at the EU level, for halving the number of fatalities in road traffic between 2019 and 2030. That translates to a more stringent interim target of no more than 110 fatalities.

In 2022 there were 227 fatalities in road traffic accidents, see Figure 1. That is an increase by 17 fatalities, or 8 per cent, on the previous year, when there were 210 fatalities. The number of fatalities is thus below the level for being on track to attain the 2030 target.

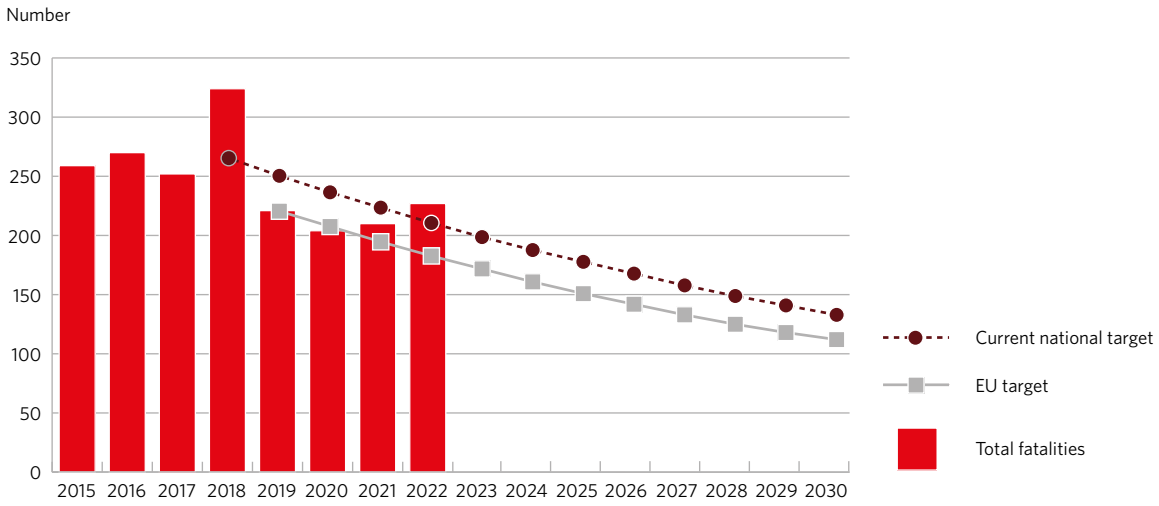

Figure 1. Number of fatalities in road traffic accidents 2015–2022, and the necessary trend until 2030. Source: Swedish Transport Agency.

The outcomes for 2022 – at least during the early part of the year – still retain some of the effects of the pandemic, which altered the circumstances in society throughout 2020 and 2021. Changes in traffic volumes and composition have had a direct effect. Traffic volume measurements show an increase of 2.8 per cent for all of 2022 compared with 2021, which in turn showed an increase of 4.2 per cent on 2020. The increases in traffic volume may be one explanation for the number of traffic fatalities increasing in 2021 and 2022.

Figure 1 shows the necessary trend for attaining the EU target. It indicates that the number of fatalities in 2022 was not on track with the necessary trend for attaining a maximum of 110 fatalities by 2030.

Road user categories

Compared with 2021, the number of fatalities was largely unchanged in all road user categories except moped riders and occupants in passenger cars, see Figure 2. Moped riders are the only group showing a clear increase compared with previous years.

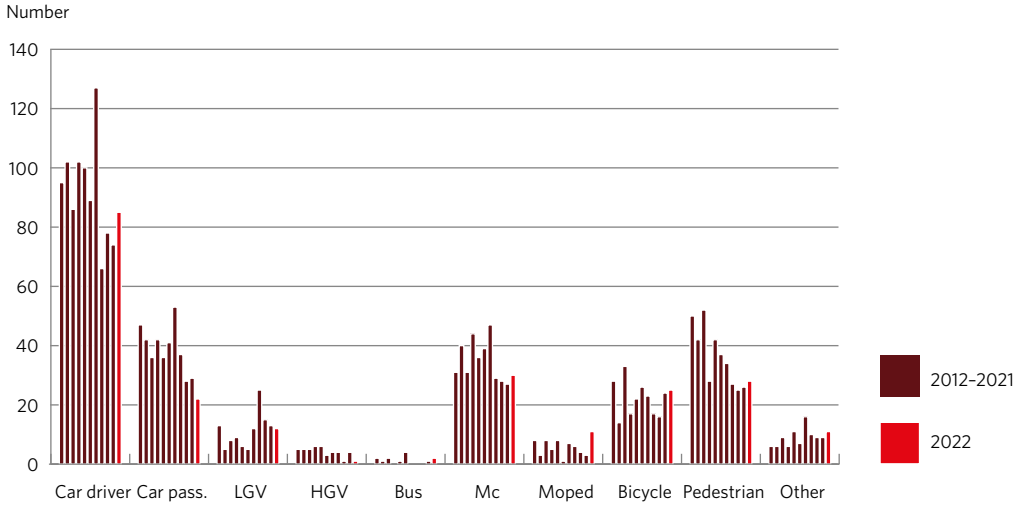

Figure 2. Number of fatalities by road user category, 2012–2022.
Source: Swedish Transport Agency.

Historically, passenger car occupants are the biggest single group in traffic fatalities. 107 passenger car occupants were killed in 2022, and 103 were killed in 2021. The trend for drivers and passengers diverges somewhat since the pandemic. The number of fatalities among drivers has increased, while a reduction can be noted among passengers.

In 2022 there were 13 fatalities among people in goods vehicles (trucks and lorries), which was four fewer fatalities than in 2021, when there were 17. A majority of the goods vehicle fatalities occurred in light goods vehicles. In 2022 there were 12 fatalities in light goods vehicles, compared with 13 in 2021. In a collision, the mass of heavy goods vehicles constitutes a considerable risk. In 2022 there were 53 fatalities in such accidents, see Figure 3. That corresponds to 23 per cent of the total number of fatalities in road traffic. The vast majority of these accidents were caused by the other party rather than the goods vehicle. One passenger and one driver were killed on buses in 2022. In the preceding year there was one fatality on a bus, which was a passenger.

The number of fatalities on motorcycles increased by three, from 27 in 2021 to 30 in 2022. The outcome over the past four years has thus remained unchanged at around 13 per cent of all fatalities.

In 2022 there were 26 traffic accident fatalities among cyclists and 28 among pedestrians. The figures for 2021 were 24 and 26, respectively. About 65 per cent of pedestrians and cyclists are killed within urban areas. The proportion of cyclists and pedestrians in the total number of road traffic fatalities was 22 per cent, which has been a fairly constant percentage over time.

Two transport modes which have received attention in the media are electric scooters and A tractors (car-derived vehicles that have been formally converted into tractors with a maximum speed of 30 km/h). In 2022 there were four fatalities on electric scooters and four in A tractors, compared with two and none, respectively, in 2021. Electric scooters are included in the ”Bicycle” category and A tractors in the ”Other” category in Figure 2.

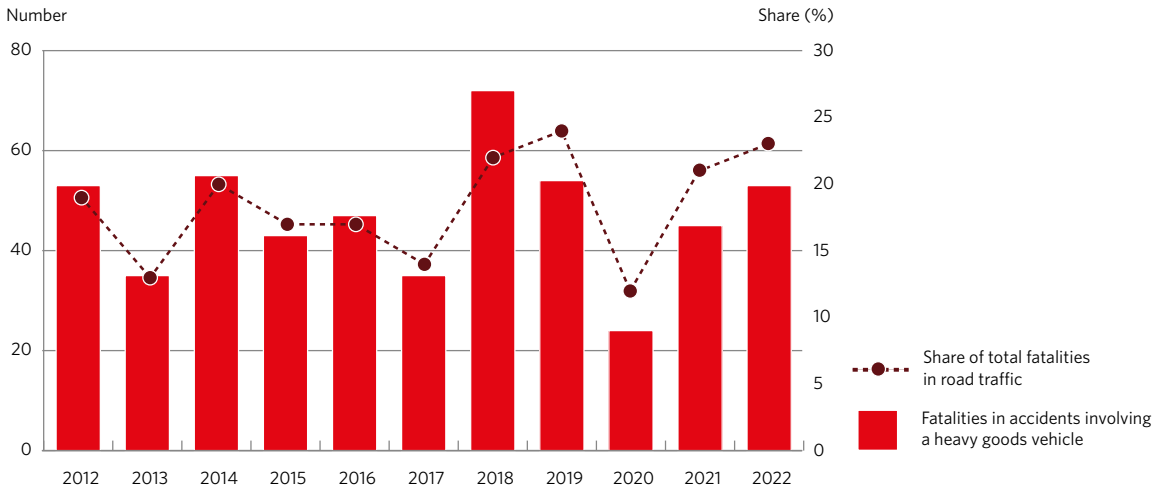

Figure 3. Number and share of road users killed in accidents involving a heavy goods vehicle, 2012–2022. Source: Swedish Transport Agency.

Accident type

The number of single-vehicle fatal accidents has decreased; it was previously the dominant accident type by some margin. Instead, head-on accidents have increased compared with previous years, see Figure 4. Over the past three years, the number of fatalities in single-vehicle accidents has fallen to the level of head-on accident type, which has remained relatively stable over the past decade. One explanation for this reduction is that fewer motorcyclists were killed in single-vehicle accidents over the past three years, but a reduction can be seen for passenger cars as well. In 2022 there were 55 fatalities in single-vehicle accidents and 58 in head-on accidents. The figures for 2021 were 57 and 56, respectively.

Fatalities in accidents related to intersections, such as side-impact, turn-off and to some degree rear-end accidents were equal in number of the past three years. A total of 21 fatalities occurred in such accidents in 2022, compared with 26 in 2021 and 27 in 2020. There were more rear-end accidents, while at the same time the number of side-impact accidents decreased. Compared over a longer period of time, we see that the share of purely intersection-related accidents (side-impact/turn-off) has remained at around 10 per cent of the total number of fatal accidents.

In 2022 there were 26 fatalities in collisions between motor vehicles and pedestrians. The figure for 2021 was 22. There were 15 fatalities in which cyclists and moped riders were hit by another vehicle, which is an increase on 2021, when there were 8 fatalities. Even though we now see an increase in 2022, the trend for accidents in which pedestrians, cyclists and moped riders are hit has shown a decline.

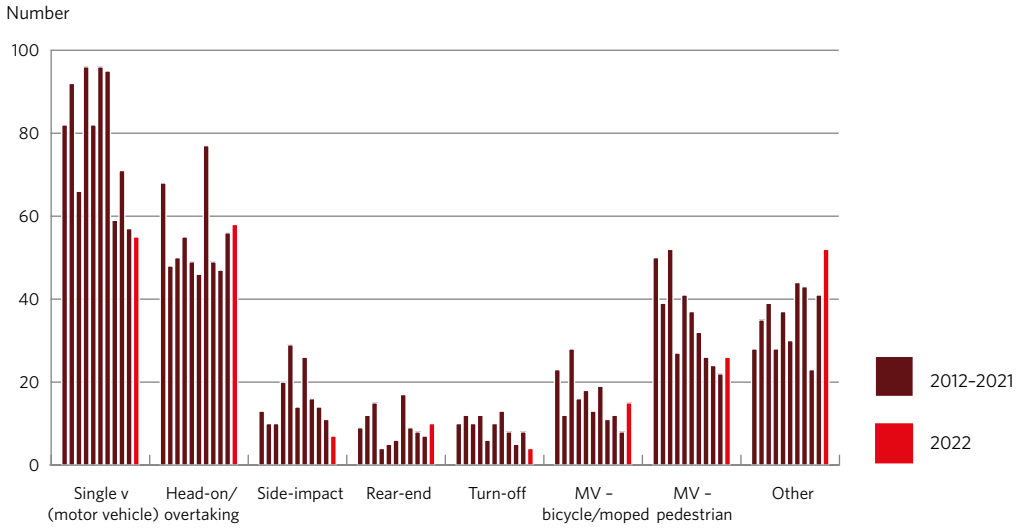

Figure 4. Number of fatalities divided by type of accident, 2012–2022.
Source: Swedish Transport Agency.

Age

In 2022 there was a clear increase in the number of fatalities in the 55–64 and 65–74 age groups, compared with 2021. We also see a continued increase in the 25–34 and 35–44 age groups, but this is from an unusually low figure for the 35–44 age group in 2020. Among other age groups we seen an increase among children aged 0–17 compared with 2021, but not compared with 2020.

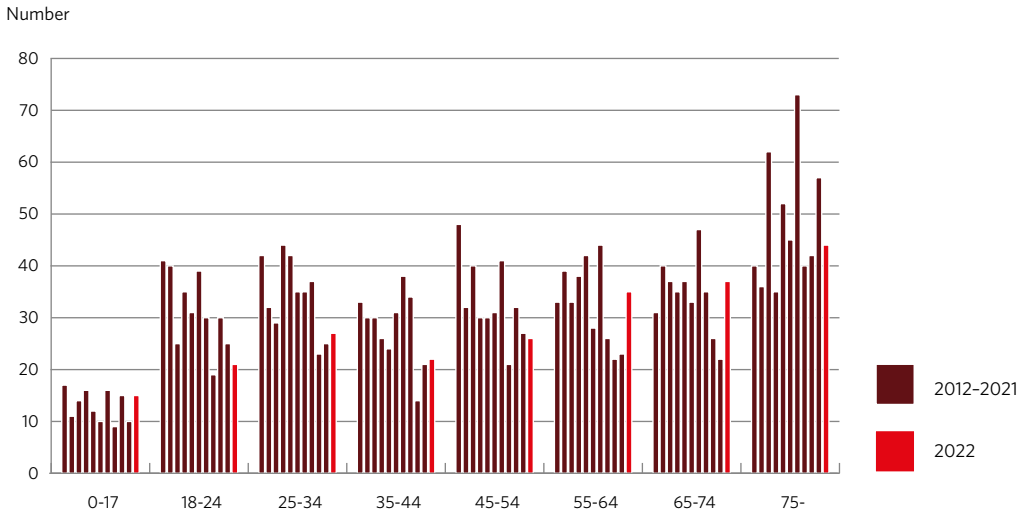

Figure 5. Number of fatalities divided by age group, 2012–2022.
Source: Swedish Transport Agency.

Sex

Historically, three quarters of all fatalities in road traffic are men. Men also represent more than half, or 56 per cent, of travel undertaken in road traffic. This means that men are over-represented among traffic fatalities even we adjust for the volume of travel. The share of men among fatalities in 2022 was 75 per cent. In fatalities among motor vehicle drivers, men represented 80 per cent.

Road authorities

Most of the total distance travelled in motor vehicles uses the national road network. That is also where most fatalities among road users occur. In 2022 there were 153 fatalities in the national road network, 55 in the municipal road network and 19 on private roads. The corresponding figures for 2021 were 147, 39 and 24, respectively. The number of fatalities on the national road network in 2022 is 19 per cent lower than the annual average in 2012–2020. A similar comparison for the municipal network shows that fatalities in 2022 decreased by 1 per cent.

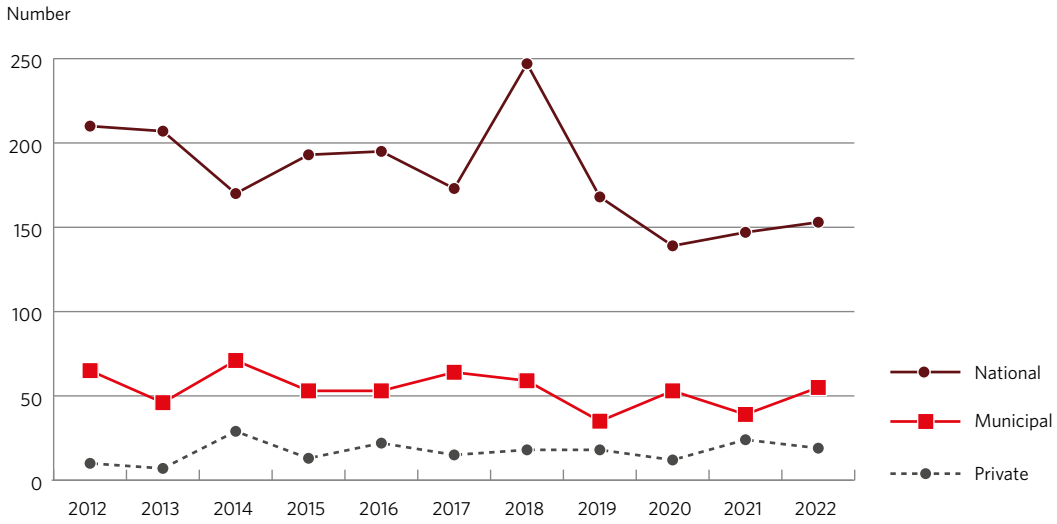

Figure 6. Number of fatalities divided by road operator, 2012–2022. Source: Swedish Transport Agency..

Number of suicides in the road transport system

	Starting point (2017–2019 average)	2022	Necessary level 2030	Assessed progress towards necessary level
Number of suicides in the road transport sector	52	Not esta-blished	Reduced	Cannot be assessed

As part of the Swedish Transport Administration's coordination of overall road safety work, two targets have been adopted for all stakeholders by GNS (Gruppen för Nollvisionen i samverkan, or the Vision Zero Collaboration Group), and these targets should be tracked in the same systematic manner as the government's interim targets.

One of the targets is for the number of suicides in the road transport sector, including jumping off bridges, to be reduced between 2020 and 2030.

This target may become more specific in the future, when additional documentation has been collated. Over the past decade, the annual number of suicides has been around 25–35, and over the same period suicides by jumping off bridges have averaged 20 per year.

Since 2010 Sweden has used a purpose-made classification method to establish which road traffic fatalities are suicides and which are accidents (Swedish Transport Administration 2014:113).

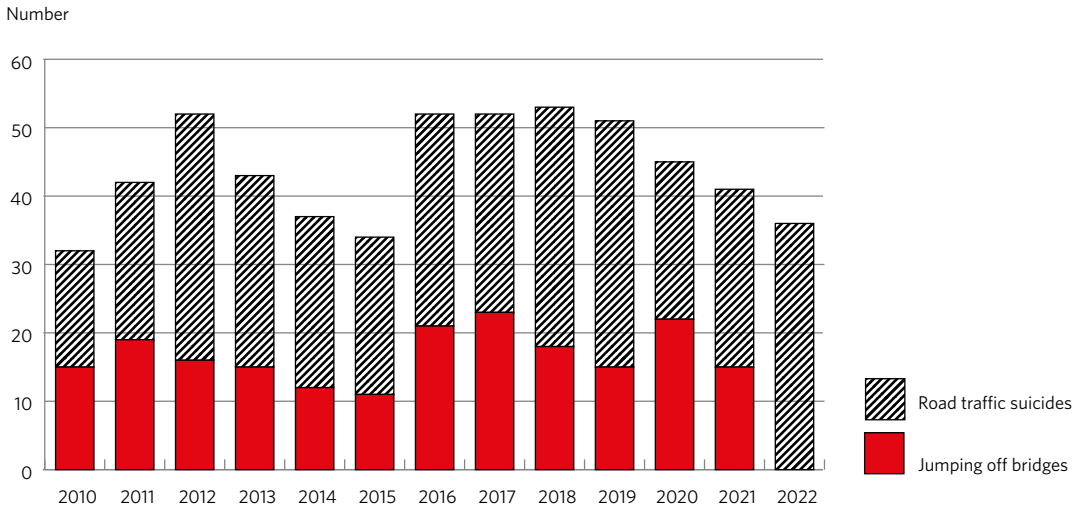

Figure 7. Number of suicides in road traffic and number of suicides by jumping off bridges during the 2010–2022 period. Source: Swedish Transport Agency and the Swedish National Board of Forensic Medicine (Rättsmedicinalverket).

In 2022 there were 36 road traffic suicides; definitive figures for the number of deaths from jumping off bridges has not been established.

The share of suicides among road traffic fatalities has averaged 10 per cent over the past decade. In 2022 the share was 14 per cent.

Analysis and discussion

Just over 80 per cent of suicides occur in the national road network. Three types of collisions can be distinguished: single-vehicle collisions, head-on collisions and pedestrians in collisions with motor vehicles. These three types of collisions represent more than 95 per cent of all suicides in road traffic.

Previous analyses (Swedish Transport Administration 2017:009) have shown that a large proportion of suicides by pedestrians occur in urban areas or in close to urban areas, on roads with 80 km/h speed limits or higher – usually motorways or 2+1 roads. About 60 per cent of suicides in head-on collisions occur on roads with an annual average daily traffic (AADT) of 4 000 vehicles or more. Common collision objects in single-vehicle collisions included trees, rock walls and bridge piers/foundations.

Just over 80 per cent of suicides are men, which is a higher proportion than among fatalities due to accidents.

A method has been developed in collaboration with the Swedish National Board of Forensic Medicine for estimating the number of fatalities that occur as a result of people jumping of bridges, and where these occur (Swedish Transport Administration et al. 2022). Approximately 17 people died in this way every year during the period from 2008 until 2021. These deaths mostly

occur in urban areas (Fredin-Knutzen et al. 2023). High bridges are particularly common, but also bridges across roads with high speeds and traffic flows. In the latter case it is not usually the height of the fall that causes deadly injuries, but the subsequent collisions with vehicles.

Number of seriously injured

The basis for the interim target is the average outcome for the years2017–2019, which means that the number of seriously injured is to decrease by 25 per cent (excluding falls) by 2030. “Seriously injured” means someone who has suffered at least a 1 per cent permanent medical impairment as a result of a road traffic accident. “Medical impairment” is a term used by insurers to assess degrees of functional impairment, irrespective of the cause. However, a problem in using medical impairment for assessments is that a long period of time often elapses between injury and confirmed impairment. Another method has therefore been used since 2007 which makes it possible to forecast the number of people with a medical impairment.

This method is described in Malm et al. (2008). An injury is considered very serious if it causes 10 per cent medical impairment or more. The source used for data on seriously injured road users is Strada, which is based on information from the police and emergency hospitals. The number of seriously injured is estimated on the basis of all injuries reported to medical care services that have occurred in road traffic. This is because it is only possible to forecast the number of seriously injured by means of medically assessed injury data.

The Swedish Transport Agency has proposed a new method for non-response compensation for seriously injured road users. A consultation on the proposal was carried out in the spring of 2023, and the proposal will be circulated for comment during 2023. As the method has not been officially adopted, no data on seriously injured road users was produced in 2022. This also means that new interim targets for 2030 will be set on the basis of the 2017–2019 average once a new method has been adopted.

Number of seriously injured in pedestrian falls

GIn 2020 GNS väg (Gruppen för Nollvisionen i samverkan, or the Vision Zero Collaboration Group) adopted shared road safety targets within the framework of stakeholder collaboration. The group decided that these targets should be tracked in the same systematic manner as the government’s interim targets.

One of the targets adopted was that the number of seriously injured pedestrians in falls in road traffic is to be reduced by 25 per cent between 2020 and 2030. The target is computed in the same way as the interim targets, from the 2017–2019 average.

The outcome for 2022 has not been established (see Number of seriously injured).

Number of seriously injured cyclists in single-vehicle accidents

The number of seriously injured cyclists has not decreased at the same rate as the numbers of other seriously injured road users. GNS väg has therefore adopted an outcome indicator for the number of seriously injured cyclists in single-vehicle accidents, in order to be able to attain the interim target for the number of seriously injured in road traffic. This target is set on the same principle as the target for the number of seriously injured in falls, i.e. a reduction by 25 per cent on the base figure.

The outcome for 2022 has not been established (see Number of seriously injured).

System indicators

The system indicators follow up the design of the road transport system at the system level. The composition of the indicators and their respective necessary levels in 2030 are based on the scenarios/forecasts referred to above (Memorandum: Prognos av trafiksäkerhetsutvecklingen och scenarier för att nå målnivåer 2030 och 2050, TRV 2021/72599, or "Road safety trends forecast and scenarios for attaining target levels in 2030 and 2050").

Safe roads, national road network

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of traffic volume on roads with median barriers, national road network and speed limits 90–120 km/h	85 %	86 %	96 %	Not on track
Share of traffic volume on roads with median barriers, national road network and speed limits 80–120 km/h	64 %	65 %	70 %	On track

Indicator for roads with speed limits of 90–120 km/h:

The necessary level for the safe national roads indicator is for at least 96 per cent of the traffic volume on roads with speed limits above 80 km/h to be on roads with median barriers. This necessary level can be attained either by lowering speed limits or by installing median barriers.

Indicator for roads with speed limits of 80–120 km/h

The necessary level for attaining the 2030 interim targets is for at least 70 per cent of the traffic volume on roads with speed limits above 70 km/h to be on roads with median barriers, since lowering the speed limit to 80 km/h is only a temporary solution along certain sections of road.

One indicator is about lowering speed limits or installing median barriers on roads currently without median barriers, while the other is about rebuilding traffic-intensive 80 km/h roads into roads with median barriers. The latter might be traffic-intensive roads where speed limits have been lowered from 90 to 80 km/h pending installation of median barriers.

Additional examples of measures in the national road network include implementing side barriers and centre line rumble strips, as well as intersection measures and measures for safer cycling.

Trend and progress towards the 2030 target

On national roads with speed limits above 80 km/h, 84.8 per cent of the traffic volume occurred on roads with median barriers. Despite a continuing positive trend, from about 30 per cent in 1996, this indicator is not on track to reach the necessary level.

On national roads with speed limits above 70 km/h, 65.0 per cent of the traffic volume occurred on roads with median barriers. At the end of 2022 this indicator was on track to reach the necessary level, see Figure 9.

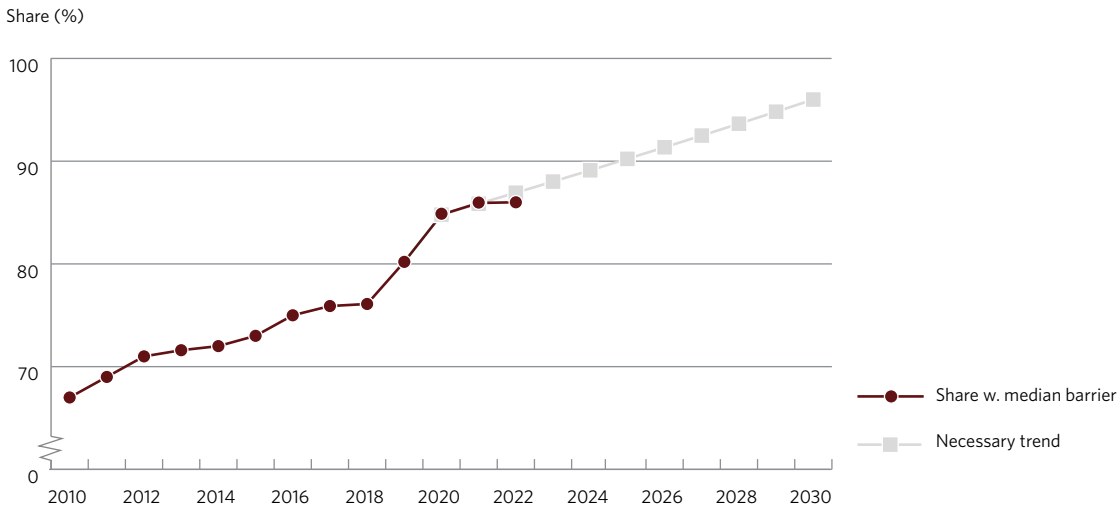

Figure 8. Share of traffic volume with median barriers on roads with speed limits of 90–120 km/h 2010–2022, and the necessary trend until 2030. Source: Swedish Transport

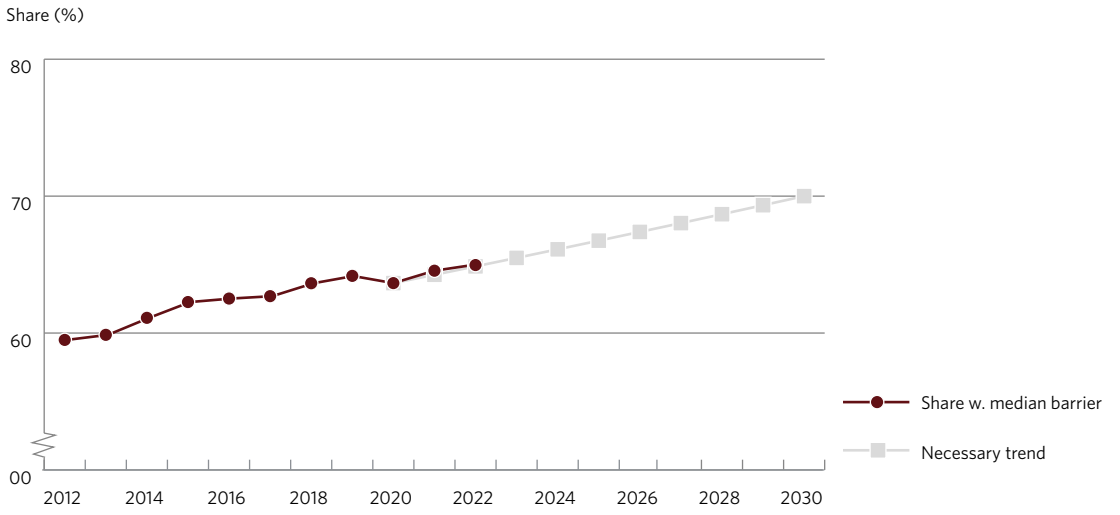

Figure 9. Share of traffic volume with median barriers on roads with speed limits of 80–120 km/h 2010–2022, and the necessary trend until 2030.

Analysis and discussion

140 kilometres of roads with median barriers were added during 2021 and 2022, but no roads had their speed limits lowered from 90 to 80 km/h. This meant that the outcome for the indicator for roads with speed limits of 90–120 km/h decreased by 1.1 percentage points, from 85.9 per cent 2021 to 84.8 per cent 2022, regressing to the 2020 starting point. An increased pace of adding median barriers to roads, or a lowering of speed limits would have been required in order for the trend to be on track to reach the necessary level.

At the end of 2022 there was a total of 5 620 kilometres of road with median barriers. That corresponds to only 6 per cent of the national road network, but it is on these roads that more than half of the total traffic volume occurs. Among national roads with speed limits above 80 km/h there were 4 970 kilometres of road with median barriers at the end of 2022, which corresponds to 36 per cent of the total length of national roads with speed limits above 80 km/h. This means that we currently have 8 870 kilometres of road without median barriers and with speed limits of 90 or 100 km/h. Table 1 describes the trend for the number of kilometres of road with median barriers.

Table 1. Roads with median barriers 2012–2022, length in km at year's end.
Source: Swedish Transport Administration.

	Motorway	2+1 road, median barrier	Dual carriageway	Arterial road, median barrier	Total
2012	199	225	17	40	482
2013	200	236	17	40	492
2014	205	245	17	39	505
2015	207	252	16	39	514
2016	207	257	17	39	520
2017	208	262	17	40	526
2018	208	269	18	40	535
2019	208	275	18	42	543
2020	212	277	17	42	547
2021	212	283	17	42	555
2022	214	289	18	41	562

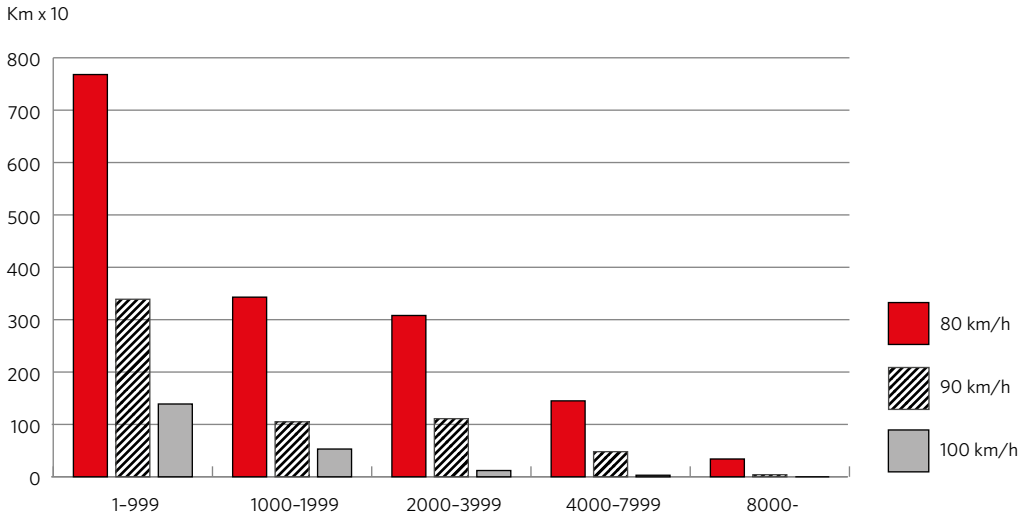

Figure 10. Roads without median barriers divided by AADT intervals, tens of kilometres at the end of 2022. Source: Swedish Transport Administration.

In its directive for planning of measures 2014–2025, the government stated that ”It is important to continue systematically adapting speed limits to road standards in order to achieve an effective and safe transport system. It also continues to be important to try to counter the negative effects that may arise in the form of reduced mobility and increased travel times. It is therefore not currently appropriate to carry out further extensive reforms of the speed limits system. Continued work should be done within the framework of the existing speed limits system, and should consider road safety, the environment and mobility.”

The Swedish Transport Administration has applied a plan under which all roads with an AADT above 2 000 and without median barriers should have a maximum speed limit of 80 km/h. This plan was revised in 2023 such that speed limits in future will be lowered to 80 km/h on sections of road whose length is not great enough to have any considerable impact on travel times. For longer sections of road, the Swedish Transport Administration will carry out more in-depth studies. These in-depth studies include collaboration with other affected stakeholders. Adjacent sections of road not subject to speed reductions will also be considered, in order to ensure that road function is regarded from a holistic perspective. The work must be creative, and the Swedish Transport Administration will be able in the studies to try new cost-effective measures or new combinations of existing road safety measures to complement any speed adaptations. Pilot schemes will likely be carried out, but a more systematic application of new and more innovative measures may require exemptions from and/or updates to existing regulatory frameworks. This means that it is not possible to state exactly how many kilometres of road will receive speed adaptations in the near future.

A reduction from 90 to 80 km/h on roads without median barriers lowers the risks of both accidents and injury along them, but not nearly to as high an extent as median barriers do. This is clear from accident statistics, which shows that about two thirds of head-on collisions with fatal consequences occurred on roads with 70 and 80 km/h speed limits in 2022.

There is also reason to review speed limits on national roads within urban areas. Much as a new base speed of 40 km/h is assumed to be a fundamental condition for achieving a safe urban environment in the municipal road network, it must equally be assumed that this is a fundamental condition for the same outcome on national roads within urban areas.

Safe intersections, national road network

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of vehicles in intersections with a *good* or *very good* road safety classification	–	74 %	85 %	Cannot be assessed
Share of vehicles in intersections with a *very good, good*, or *fair* road safety classification	–	91 %	99 %	Cannot be assessed

The necessary level in 2030 is for incoming annual average daily traffic of vehicles in intersections with a very good or good road safety classification make up at least 85 per cent of incoming annual average daily traffic in all classified intersections in the national road network. Additionally, the necessary level in 2030 for intersections classified as very good, good, or fair must be at least 99 per cent. The outcomes in 2022 were 74 and 91 per cent, respectively.

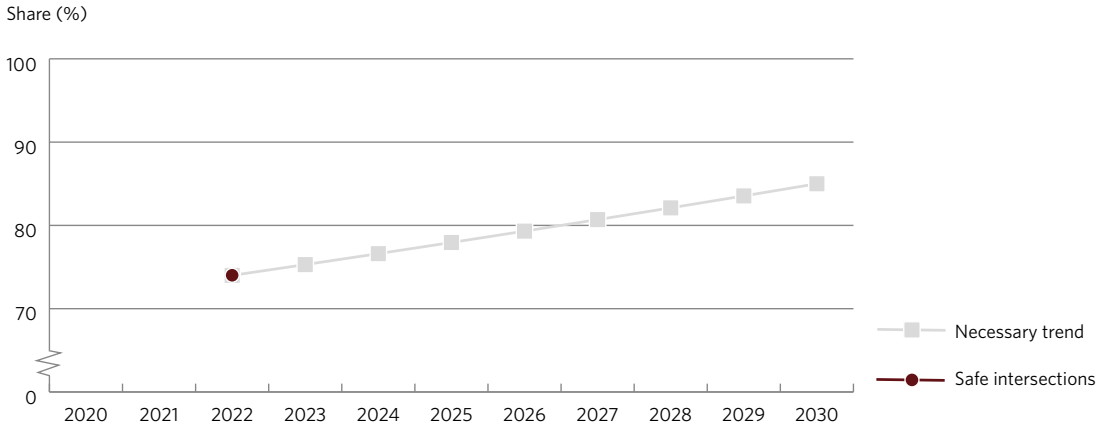

Figure 11. Share of vehicles in intersections with a very good or good road safety classification, 2020–2022, and the necessary trend towards 2030. Source: Swedish Transport Administration.

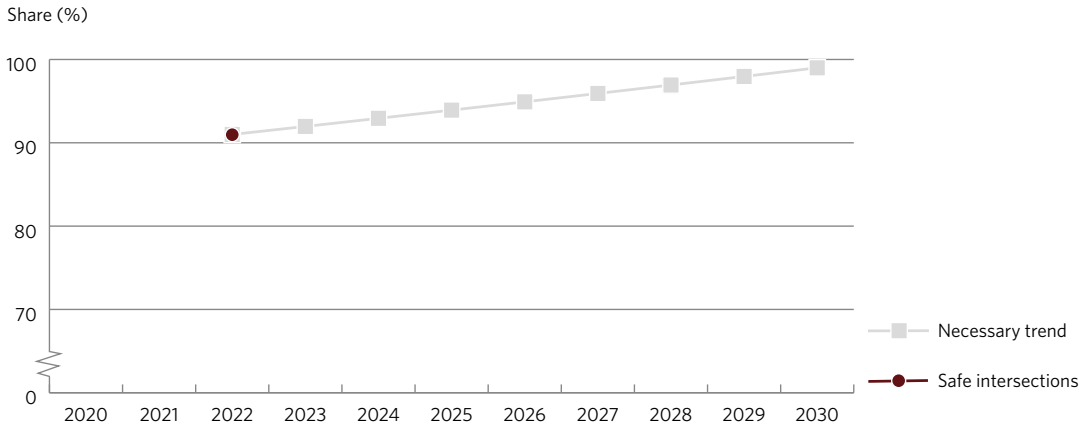

Figure 12. Share of vehicles in intersections with a very good, good or fair road safety classification, 2020–2022, and the necessary trend towards 2030. Source: Swedish Transport Administration.

The Swedish Transport Administration has carried out a safety classification of national road intersections with annual average daily traffic of at least 2 000 vehicles on primary roads, and at least 100 vehicles on secondary roads (TDOK 2013:0636). Intersections with important municipal connections along national roads were also classified, and are included in this indicator. These are intersections with at least 2 000 vehicles on primary roads and with a 0–6 functional road classification on secondary roads. At the end of 2022 a total of 8 311 intersections had been classified, see Table 2.

One indicator is about improving road safety in intersections with a low road safety classification, and the other about also improving intersections with a fair road safety classification. There are a total of 1 241 intersections with a low classification which are the object of measures, and 2 521 intersections with a fair classification.

The indicators are based on the share of vehicles in intersections, which justifies prioritising measures in high-intensity intersections.

Table 2. Number of road safety classified intersections in the national road network divided by intersection type and speed limit, 2022. The classifications
Very Good and Good are shown in green colours, Fair in yellow and Low in red.

	Speed limit (km/h)										
Intersection	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**Total**
Interchange		5	38	32	159	139	78	219	274	43	987
Roundabout	11	94	249	250	229	83					916
Drop shaped roundabout		2	10	21	16	9	1	1	2		62
Traffic light-regulated intersection	1	18	70	38	54	6		1			188
Three-legged intersection, speed regulated*	15	64	74	61	166	216	52	2	1		651
Three-legged intersection with continuous speed**	29	345	593	364	886	824	192	203	25		3461
Three-legged intersection with local reduction***		13	30	25	63	17	4				152
Four-legged intersection, speed regulated*	4	20	41	36	63	113	29	3			309
Four-legged intersection with continuous speed **	25	214	287	113	302	236	79	151	13	1	1421
Four-legged intersection with local reduction ***	3	11	32	23	79	12	4				164
Total	**88**	**786**	**1 424**	**963**	**2 017**	**1 655**	**439**	**580**	**315**	**44**	**8 311**

* Speed regulated means that there are traffic calming devices (narrowing to one lane, bumps, staggered sections, traffic islands etc.) and/or automatic traffic safety control (a system for speed monitoring with traffic safety cameras, abbreviated ATK in Swedish) within a maximum distance of 500 metres from three- or four-legged intersections, provided the speed regulation (traffic calming device and/or ATK) lies along the intersection's primary road.

** Continuous speed means that there is no local reduction***.

*** Local reduction means that the speed limit 400 metres before and after the intersection is higher than at the intersection and that occurrence is only required in one direction along the primary road.

Analysis and discussion

Grade-separated interchanges, roundabouts and drops often receive a very good or good road safety classification. For other types of intersections, which are on one level, a maximum speed of 70 km/h is required in order to receive a good road safety classification. This can be achieved through speed regulation, e.g. ATK and approaches with chicanes. Without speed regulation, additional speed limit margin is required in the form of a lower speed

limit in order for actual speeds not to exceed 70 km/h. Local speed limit reduction requires a greater speed limit margin (e.g. 50 km/h for a three-legged intersection) than continuous speed limit reduction (e.g. 60 km/h for a three-legged intersection).

Safe pedestrian, bicycle and moped crossings, national and municipal road networks

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of pedestrian, bicycle and moped crossings of *good* or *fair* safety classification, **national road network**	60 %	61 %	80 %	Not on track
Share of pedestrian, bicycle and moped crossings of *good* or *fair* safety classification, **municipal road network**	50 %	52 %	75 %	Not on track

The target for the Safe pedestrian, bicycle and moped crossings indicator is for at least 80 per cent of all passages in the main national road network for cars with an AADT of at least 2 000 vehicles to be of good or fair standard. The main national network here refers to streets and roads with functional road classifications 0–5. An additional limitation is road numbers up to 500. The corresponding necessary level for the municipal road network is 75 per cent.

A pedestrian, bicycle and moped crossing is defined as being of good road safety standard if it is grade-separated or if 85 per cent of occupants pass it at a maximum speed of 30 km/h. The latter is most effectively achieved by installing some form of physical traffic calming device in conjunction with the crossing. The requirement for a fair road safety standard is a 30 km/h speed limit, a 40 km/h speed limit with traffic lights, or narrowing within 15 metres. A difference in comparison with the earlier indicator (2020 interim target) is that the current indicator includes the fair standard. The focus is primarily on improving passages with a low standard.

Each road authority can use NVDB (Nationell vägdatabas, or the National Road Database) to report the addition of new or altered pedestrian, bicycle and moped crossings. These passages are then classified using the map application ArcGIS – Trafiksäkerhetsklassade GCMpassager (Road safety classification of pedestrian, bicycle and moped crossings), on the basis of the specified criteria.

A more systematic inventory was carried out of larger municipalities in 2013 and 2014. Today we have registered data from 205 municipalities. And in 2106

and 2017 a more systematic inventory was carried out of the national road network: European routes (Europavägar), national principal roads (riksvägar) and secondary county roads (länsvägar, with route numbers 1–500).

Comparisons between the different years should regarded with considerable caution, as the number of registered passages grows over time.

Trend and progress towards the 2030 targets

At the turn of the year 2022/2023, the share of pedestrian, bicycle and moped crossings of good or fair standard in the national road network was estimated at 61 per cent, see Figure 13. That outcome is not on track to reach the necessary level.

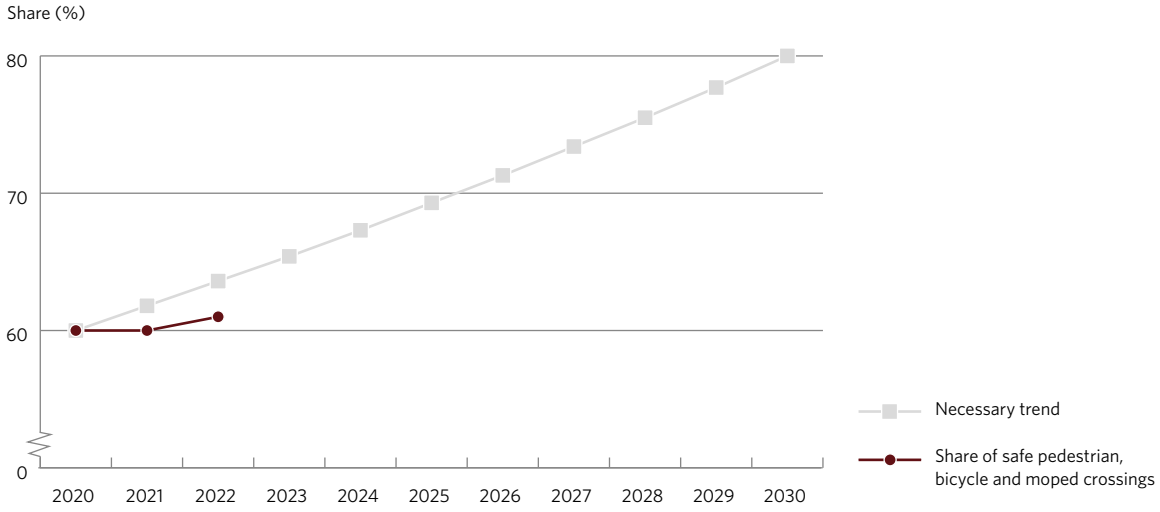

Figure 13. Share of pedestrian, bicycle and moped crossings of good or fair standard, national road network 2020–2022, and the necessary trend towards 2030.
Source: Swedish Transport Administration.

The share of passages of good or fair standard in the municipal road network was 52 per cent, see Figure 14. That is not on track to reach the necessary level.

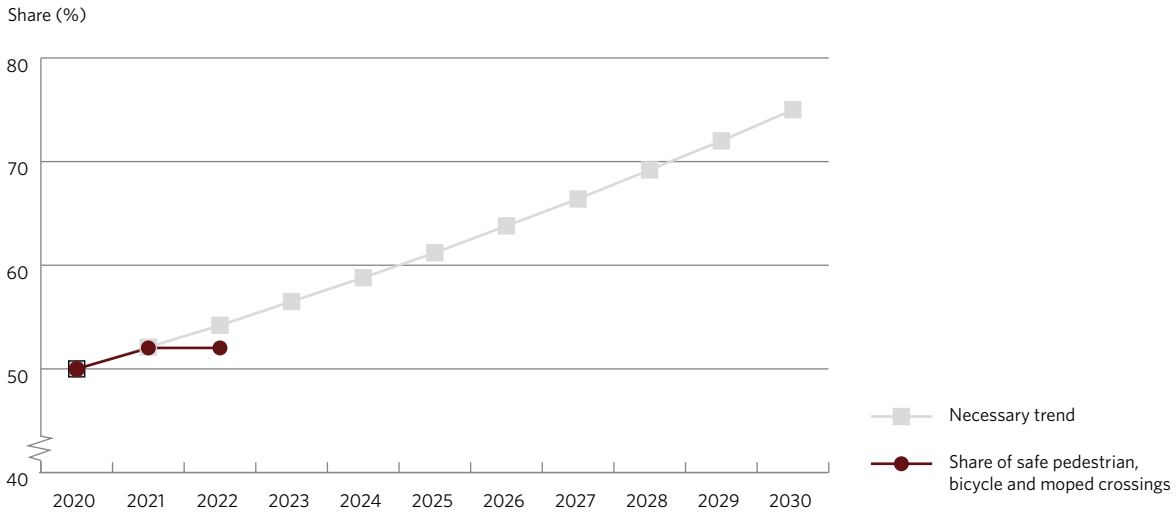

Figure 14. Share of pedestrian, bicycle and moped crossings of good or fair standard, municipal road network 2020–2022, and the necessary trend towards 2030.
Source: Swedish Transport Administration.

Analysis and discussion

There are currently 24 800 passages classified within functional road classifications 0–5, of which 19 900 municipal passages and 4 900 national ones. The statistical data has been limited to including road with route numbers under 500 and annual average daily traffic of more than 200 vehicles. Keeping that limitation constant, there are about 800 more passages than at the time of data collection one year ago.

With the reservation that the volume of data has changed over time, these outcomes suggest a slight improvement, primarily in the municipal road network, where the share of passages of *good* or *fair* safety classification has increased by 2 percentage points from the 2020 starting point. In the national road network the indicator has remained more or less unchanged throughout the same period.

Of the passages in the municipal network, 24 per cent were of *good* safety classification, while in the national road network 52 per cent were of *good* safety classification. One reason why the national road network has a higher share of good-standard passages is that it has many more passages along high-speed roads with grade separation. The share of passages of *low* safety classification, were injury levels in the event of a collision may be immediately fatal, was 48 per cent in the municipal road network and 39 per cent in the national road network.

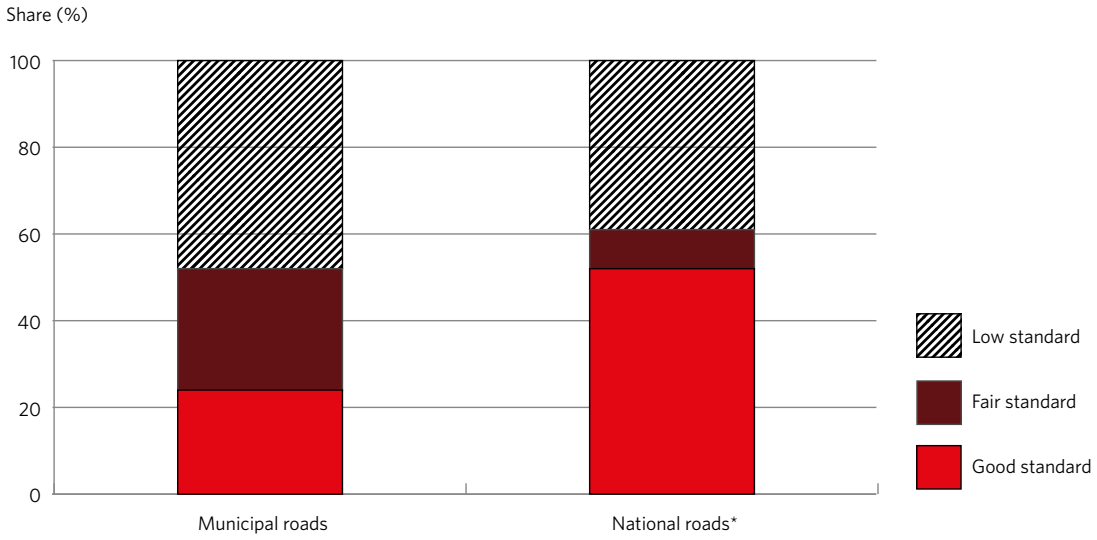

Figure 15. The share of pedestrian, bicycle and moped crossings of good, fair and low standard, respectively, in the municipal and national road networks in 2022. Source: Swedish Transport Administration.

Safe streets in urban areas

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of 30–50 km/h roads in the municipal road network where speed limits are 30 or 40 km/h	65 %	69 %	99 %	Not on track

In urban areas, which in Sweden more or less coincide with the municipal road network, a new base speed of 40 km/h is assumed to be a basic condition for achieving a safe urban environment. Additionally, 30 km/h speed limits have to be guaranteed in urban areas where vulnerable road users coexist with car traffic in a regular and planned way. It is necessary for 99 per cent of road mileage in urban areas to fulfil this by 2030. In 2022 the share that did was 69 per cent.

This indicator applies to roads in urban areas. Almost all roads in the municipal road network with speed limits between 30 and 70 km/h are in urban areas.

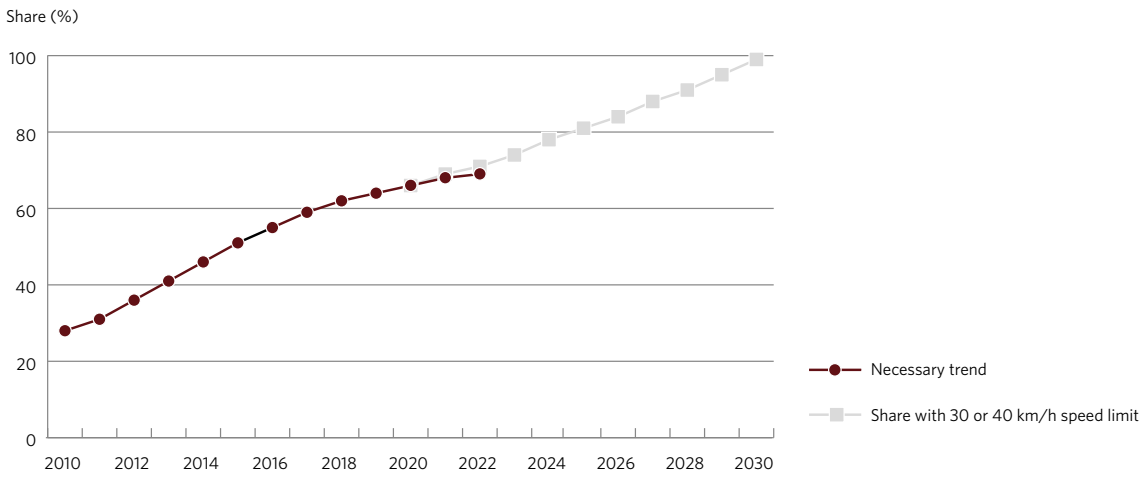

Figure 16. Share of 30–50 km/ roads in the municipal network where speed limits are 30 or 40 km/h. Source: Swedish Transport Administration.

Analysis and discussion

In order to achieve the necessary trend for the number of fatalities and seriously injured by 2030, a 30 km/h speed limit needs to be guaranteed in urban areas where vulnerable road users coexist with car traffic in a regular and planned way. This applies in particular to roads with functional road classification 6–9. About 84 per cent of the municipal road network in urban areas, with speed limits between 30 and 70 km/h, are roads with functional road classification[1] 6–9, which means roads in the local road network. Functional road classification 3–5 are roads in the principal road network.

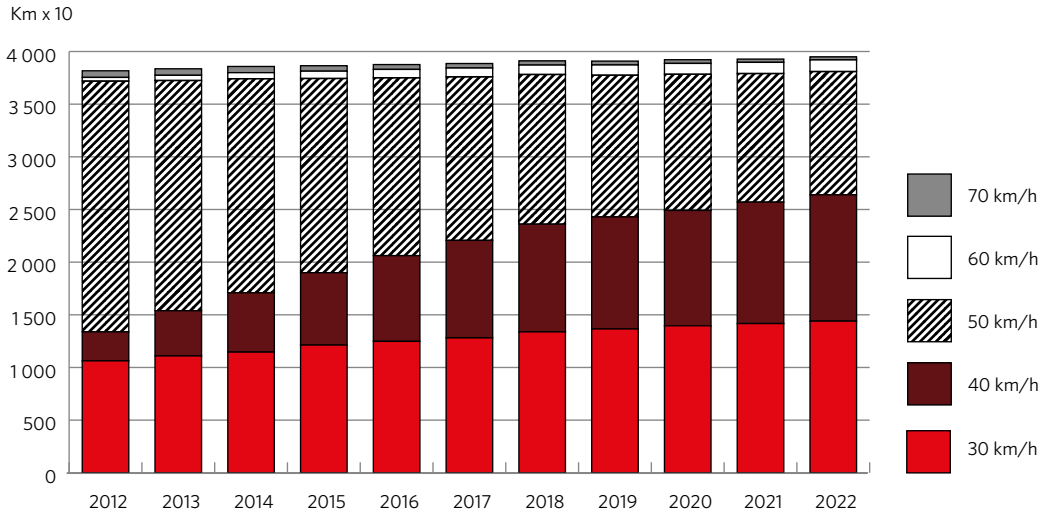

Figure 17. Tens of kilometres of road by speed limits 30–70 km/h, municipal road network in urban areas. Source: Swedish Transport Administration.

1 Functional road classification: Classification of the roads based on how important a road is for connections within the overall road network.

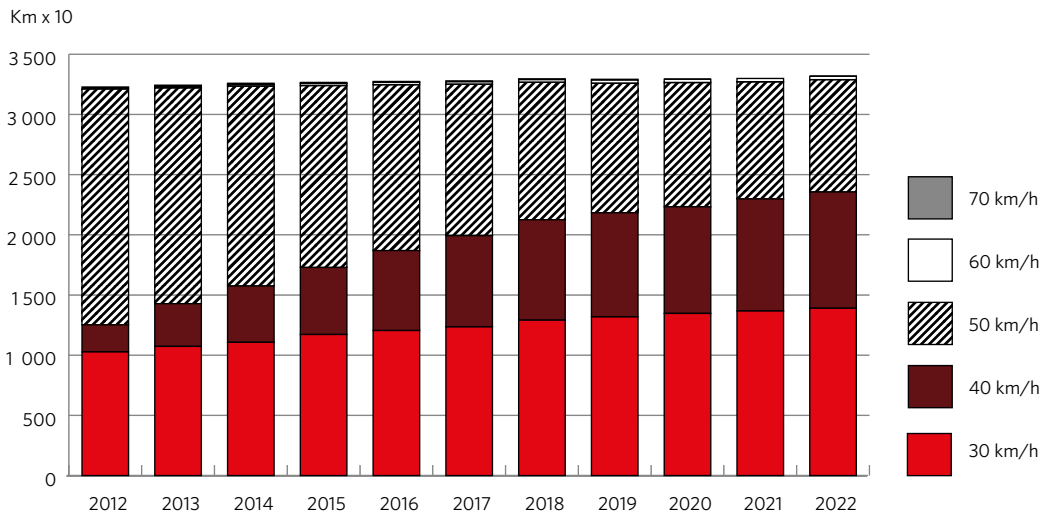

Figure 18. Tens of kilometres of road by speed limits 30–70 km/h and with functional road classification 6–9, municipal road network in urban areas.
Source: Swedish Transport Administration.

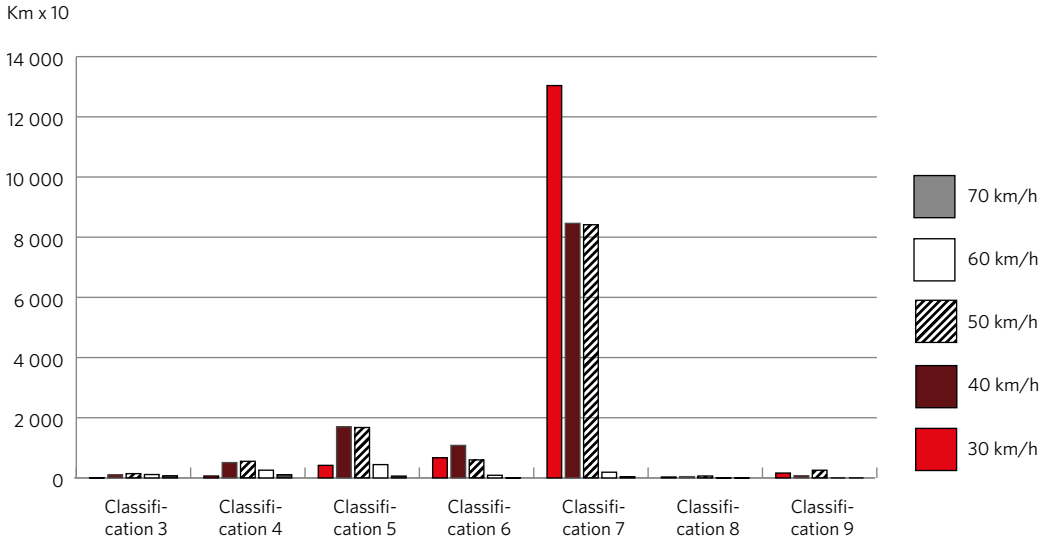

Figure 19. Tens of kilometres of road by functional road classification and speed limit in the municipal road network at the end of 2022.
Source: Swedish Transport Administration.

Safe vehicles

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of new passenger cars sold with a 5-star Euro NCAP rating	89 %	86 %	90 %	On track

The earlier indicator used for Safe vehicles followed up the share of the traffic volume made up of passenger cars with the highest crash safety rating for adult drivers and passengers, as rated by Euro NCAP. In connection with the revision of the indicators for the new target period, that indicator was found insufficient in terms of reflecting the safety characteristics of modern cars, as it did not consider collision avoidance technologies. The necessary level by 2030 is for at least 90 per cent of all new cars sold to have the highest safety rating in a Euro NCAP test, which is about the same level as in 2020.

However, requirements for the highest rating are being gradually raised between 2020 and 2030, which means that a 5-star car in 2030 will be considerably safer than a 5-star car in 2020. This makes the indicator somewhat more dynamic than the others, as the definition of what a safe car is changes over time – and it is important to take this into consideration. It is also important to point out that a relatively small number of tests by Euro NCAP is capable of covering about 95 per cent of new cars sold in Sweden. The remaining 5 per cent includes up to 100 different models of car, which makes it difficult to achieve more than 95 per cent 5-star cars among new cars sold.

The number of new registrations of cars in Sweden stabilised in 2022 at just under 300 000 passenger cars. About 86 per cent of these had the highest Euro NCAP safety classification, irrespective of the testing year. The share of cars awarded 5 stars in a valid test, i.e. a test from within the past 6 years, was slightly lower at around 79 per cent. The share of cars with 4 stars remained constant between 5 and 7 per cent.

This trend is deemed overall to be on track towards the necessary level for the 2030 interim target, since 4 and 5-star cars represent 93 percent of sales of new cars.

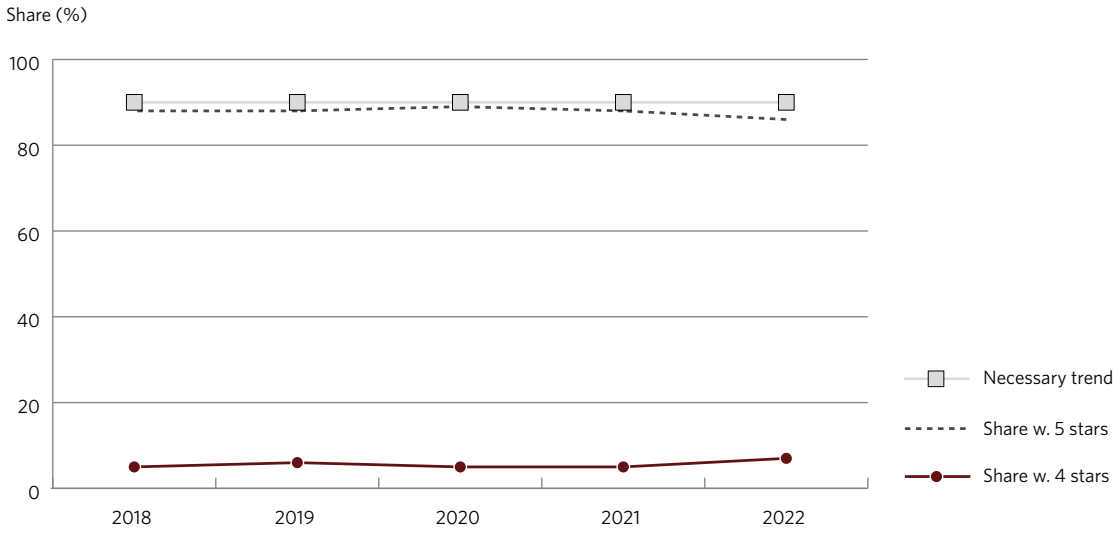

Figure 20. Share of new passenger cars sold with 5 Euro NCAP stars and 4 Euro NCAP stars, respectively.

Analysis and discussion

As older cars are scrapped and exchanged for newer cars, traffic volumes on Swedish roads consist increasingly of safer cars. This trend is also reinforced by the circumstance that on average, the annual mileage of cars is higher the newer they are. As a rule of thumb, it takes up to 30 years from the introduction of a new safety system for it to reap the maximum benefit. Examples of this include driver assistance systems such as seat belt reminders and electronic stability control, which have been included in Euro NCAP ratings since 2003 and 2009, respectively. The share of new passenger cars equipped with electronic stability control and seat belt reminders for the front seats has been just about 100 per cent since 2009.

The share of the total traffic volume in 2022 that featured passenger cars with these systems is estimated at 97–99 per cent (Figure 21). This should not be interpreted as meaning that the maximum benefit has almost been achieved, since the final percentage points of the total traffic volume, without seat belt reminders or electronic stability control, will be greatly over-represented in fatal accidents (in the same way that drunk drivers represent a very small share of the total traffic volume, yet a very much larger share of fatal accidents). According to forecasts, the last fatal accident that could have been prevented with a seat belt reminder or electronic stability control will occur around 2030–2033. This means that the maximum benefit of these systems is expected to achieved around 25–30 years after they were introduced.

It is important, therefore, for new cars sold to have all the available safety equipment – which is encouraged through legislation as well as through the continuously updated Euro NCAP test protocol. An example of such safety equipment is a system that helps the driver stay within the speed limit (Intelligent Speed Adaptation, or ISA). All new car models will be equipped with ISA from 2022 and the system will be compulsory on all new cars sold in the

EU from 2024. Another example of safety equipment is automatic emergency braking, which reduces the damage in rear-end collisions between passenger cars by around 40 per cent (Rizzi et al. 2014 and Cicchino 2017), and lane keeping assist systems, which have been shown to be effective in reducing head-on and single-vehicle accidents on roads without ice and snow (Sternlund et al. 2017, Cicchino 2018, Leslie et al. 2022). Pedestrian-friendly bumpers and bonnets, and pedestrian-detecting automatic braking systems, have also been shown to have a positive effect for vulnerable road users (Strandroth et al. 2011, Cicchino 2022). Financial incentives, e.g. ”payasyouspeed insurance”, can also have a positive effect (Stigson et al. 2014).

At the end of 2021, automatic emergency braking for rear-end collisions and pedestrians were standard on 97 per cent of all new cars sold in Sweden. Even if similar sales data for 2022 are not available yet, it is estimated that the share of the total traffic volume featuring passenger cars equipped with these systems in 2022 was 53 and 38 per cent, respectively, see Figure 21. In 2021 the share of new cars sold with lane keeping assist systems (warning and/or gentle intervention) was 26 per cent. It is important to point out,however, that there are shortcomings in historical data about new car sales with these systems, which means that the share of the total traffic volume with lane keeping assists systems in Figure 21 should be seen as a rough estimate.

The Euro NCAP test protocol has historically been a driving factor for increasing the implementation of these safety systems as standard, as the protocol gradually shifted towards only giving points to systems which were standard equipment in the cars. When other systems are available as optional extras, various means such as financial incentives in the form of lowered insurance premiums can be used to encourage consumers to opt for these extras. As 60 per cent of passenger cars are purchased by companies, it is even more important to influence these purchases.

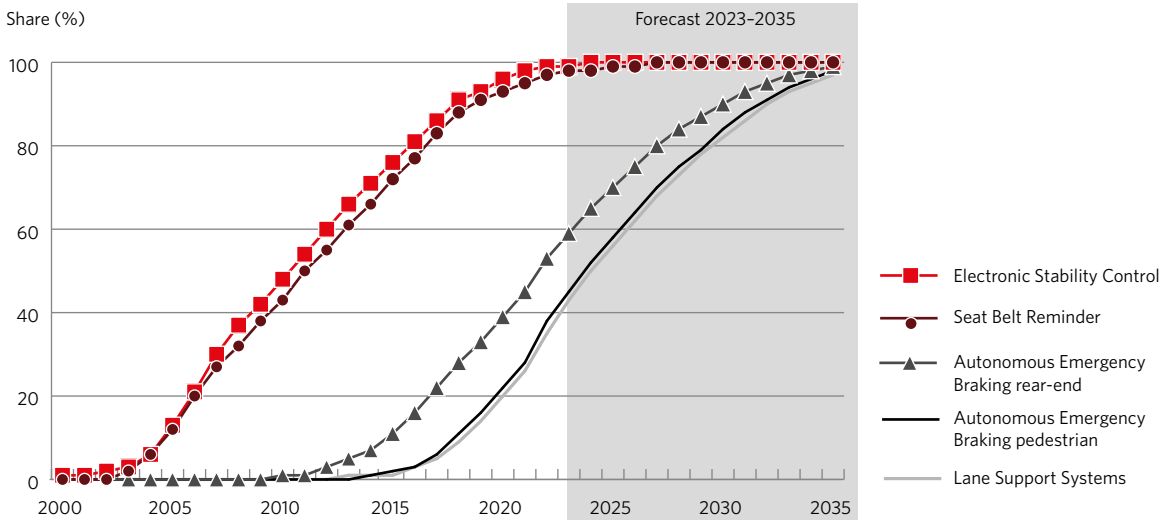

Figure 21. Share of the total traffic volume featuring passenger cars equipped with different safety systems, 2000–2022 and forecast for 2023–2035. .

* Due to insufficient data, the share given for lane support systems (warning and/or gentle intervention) should be seen as a rough estimate.

It is finally worth mentioning that Euro NCAP have started testing commercial vehicles as well. These tests began in 2020 on commercial vans, a vehicle type which was shown in the tests to be 5–6 years behind passenger cars on levels of safety, and for which the systems were often only available as optional extras. During the first year, 19 models were tested which covered about 95 per cent of new commercial van sales. The tests, which so far are focused on driver assistance systems, have already shown results in terms of some improvement in both performance and availability of systems2[2]. Commercial vehicle testing has so far followed a simpler protocol than for passenger cars, but plans are for it to have the same requirement level as for passenger cars by 2026–2027. The next step for commercial vehicles is to begin testing the safety of heavy goods vehicles3[3]. This testing programme will be introduced next year and will initially include driver assistance systems such as automatic braking and lane keeping assistance; in 2027 it will also include driver monitoring for fatigue/distraction and by 2030 will address passive safety for vulnerable road users and crash compatibility with other vehicles.

2 https://www.euroncap.com/en/ratings-rewards/commercial-van-ratings/

3 https://www.euroncap.com/en/press-media/press-releases/euro-ncap-announces-plans-for-a-new-truck-safety-rating-scheme/

Systematic measures for safe pedestrian and bicycle traffic

	Starting point 2020	Necessary level 2030	Assessed progress towards necessary level
Systematic measures for safe pedestrian and bicycle traffic	15 % (2021)	70 %	Cannot be assessed

This indicator is based on an online questionnaire sent to all municipalities in Sweden about their systematic measures for safe pedestrian and bicycle traffic. Targets and ratings were defined with reference to the poll carried out in 2021. The percentage rating is based on the share of affirmative answers to 11 questions. These include whether the municipality has adopted targets, strategies or plans for increased road safety for pedestrian and bicycle traffic. There are also questions about operation and maintenance plans. The outcome in 2021 indicated that 15 per cent of responding municipalities meet the target. The response rate was 59 per cent (171 of 290 municipalities). The target for the period is for 70 per cent of municipalities to meet the target.

The purpose of the indicator is to highlight the importance of municipalities' systematic traffic safety measures, primarily for pedestrians and cyclists, and to stimulate the implementation of measures that will have an impact on the interim targets fatalities and seriously injured in road traffic.

	Description	Number of municipalities	Share
High level	8–11 yes	26	15
Intermediate level	4–7 yes	84	49
Low level	0–3 yes	61	36
Total		171	100

The next questionnaire will be sent out in the autumn of 2023.


RPM
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7
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20
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60
80
100
120
140
160
180
200
220
km/h
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70

Road design for preventing suicides

		Necessary level 2030	Assessed progress towards necessary level
Road design for preventing suicides	Fences to prevent jumping off bridges near urban areas	50 % of selected measures	Cannot be assessed
	Access prevention along busy roads near urban areas	50 % of selected measures	Cannot be assessed
	Viaducts across busy roads near urban areas	25 % of selected measures	Cannot be assessed

A number of measures have been selected, based on established measure-effect relationships for suicide-preventive measures in road traffic, for achieving a 25 per cent reduction in suicides in road traffic by 2030. These measures include installing safety fences to prevent jumping off high national bridges and national viaducts across busy roads near urban areas. Additionally, at least 50 per cent of busy roads near urban areas have to be equipped with access prevention devices by 2030. The biggest effect will be obtained through measures on high bridges, for which reason such measures have been prioritised in planning.

Suicide prevention equipment is planned for pedestrian and cycle paths across Tvärförbindelsen Södertörn and the E4/E20 in Fittja. This involves a total of six bridges. The total construction time for the installation is ten years, and construction will begin in 2023. It is estimated that two pedestrian and cycle bridges with fences to prevent jumping off will be built by 2025.

The Förbifart Stockholm project calls for suicide prevention measures in the form of fences to prevent jumping off as well as roadway access.
These projects are expected to be completed from 2026 and later.

There are five high bridges with plans for suicide prevention measures until 2025. A further five bridges are being assessed and may be the object of measures until 2025. Another two bridges are being assessed for possible measures from 2026.

Suicide prevention has been highlighted in the requirement Object Planning TRVINFRA00214 ”Object planning of bridges and other structures”.

The regulatory framework is to be “referred to in new construction and alterations, as well as in operation and maintenance, e.g. in planning, project design, implementation and management”. Thus suicide prevention measures will be taken into consideration in connection with major maintenance works on bridges.

Use indicators

The use indicators follow up use of the road transport system, e.g. compliance with speed limits and seat belt use. These indicators were tracked during the previous target period as well; the necessary level in 2030 is based on the scenarios/forecasts referred to above.

Compliance with speed limits

Compliance with speed limits is one of the more challenging areas in attaining the 2030 interim targets. The necessary level for the compliance indicator is that reaches at least 80 per cent in both the national and the municipal road networks. At current speed limits, a compliance level of 80 per cent should correspond to a reduction in average speed of around 5 per cent.

Compliance with speed limits, national road network

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of traffic volume within speed limits, national road network	49,4 %	53,9 %	80 %	Not on track
Journey speed	76,8 km/h	75,6 km/h	73 km/h	On track

The target is for at least 80 per cent of the total traffic volume to be travelling within current speed limits in 2030. In addition to compliance with current speed limits, average journey speed is also tracked. If the target for compliance is attained this would imply an estimated reduction by 4 km/h of the average journey speed. Lowered speed is assessed to be one of the indicators with the greatest potential for reducing the number of fatalities.

Measurements to represent the entire country are carried out every four years at around 1 500 locations. Making these measurements is resource-intensive, which is why they are only carried out every four years. The most recent measurement was in 2020. For years between measurements, estimates are made instead using the Swedish Transport Administration's simpler measurements (speed index), which only indicate the relative change in speed. The data for these are generated by 81 fixed measurement points sunk into the roadway.

Trend and progress towards the 2030 target

Figure 22 shows the share of the traffic volume travelling within speed limits in the national road network. This share is estimated to have been 53.9 per cent in 2022, which is an improvement by 1.7 percentage points on 2021. The outcome for 2022 is largely on track to attain the 2030 target.

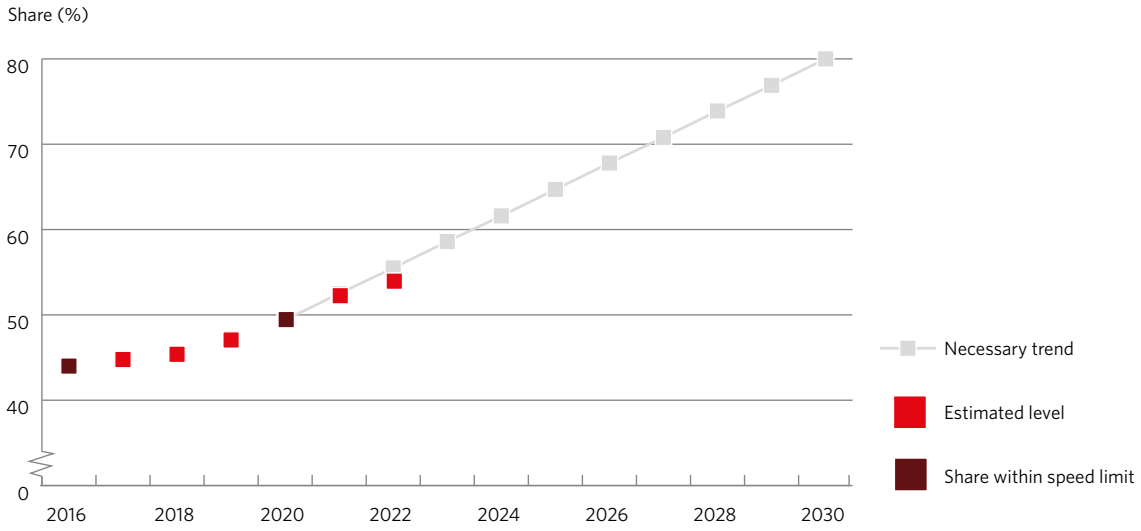

Figure 22. Share of traffic volume travelling within speed limits in the national road network, 2016 and 2020 (levels for 2017–2019 and 2021–2022 are estimates), and the necessary trend towards 2030. Source: Swedish Transport Administration.

The average journey speed is estimated to have decreased compared with 2021, from 76.0 km/h to 75.6 km/h in 2022, see Figure 23. The outcome is slightly below the necessary trend towards 2030.

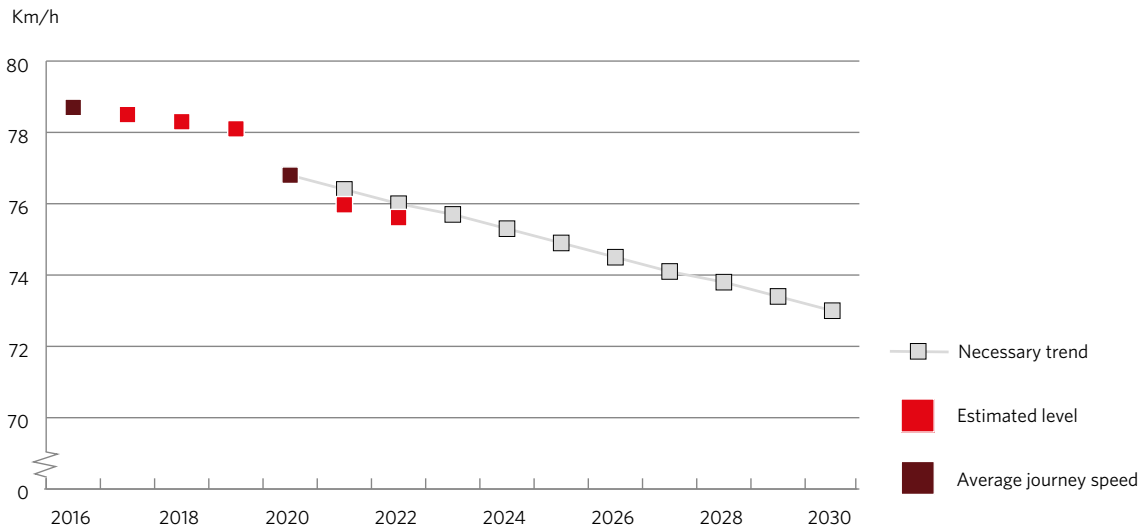

Figure 23. Average journey speed in the national road network, 2016 and 2020 (levels for 2017–2019 and 2021–2022 are estimates), and the necessary trend towards 2030. Source: Swedish Transport Administration.

Analysis and discussion

Historically, compliance with speed limits remained essentially unchanged for a long period of time before improving towards the end of the previous target period (2007–2020). Even if the target of 80 per cent compliance was not attained by far, measurements of the average speed showed a clear improvement, by 3.5 km/h. This reduction occurred entirely between 2016 and 2020. The estimated values indicate a considerable reduction from 2019 to 2020, which could be attributable to the pandemic influencing the outcome, as traffic volumes and travelpatterns changed drastically. The measured journey speed continued to drop at the same rate in 2021, but then levelled off in 2022. Increased fuel costs are another factor which may have influenced occupants' driving behaviour.

Manual speed surveillance by the police increased sharply in 2020 as a result of the introduction of digital fines. Increased time resources during the pandemic, when other types of police work were cut back, may also have contributed.

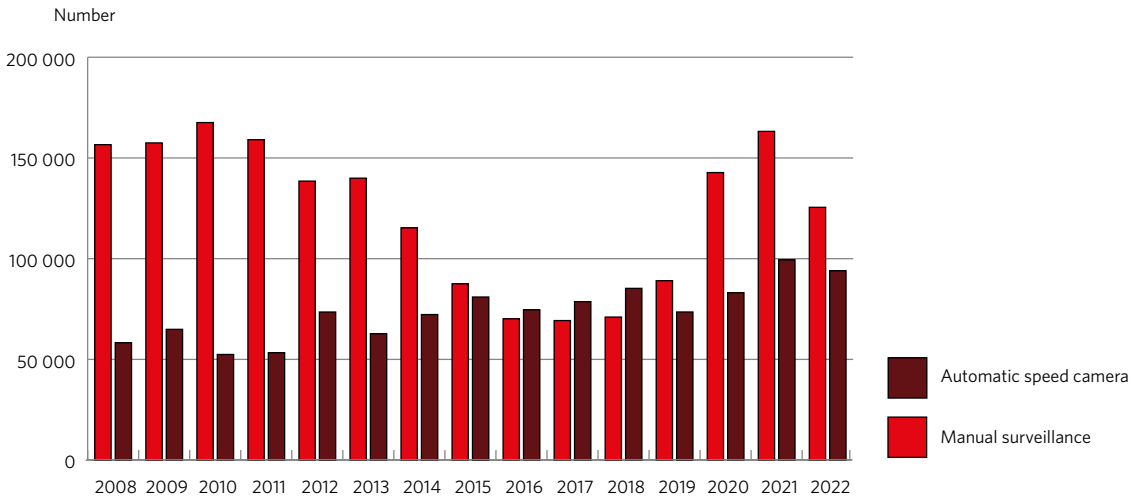

Figure 24. Number of speeding fines issued, divided by manual and automatic surveillance, 2008–2022. Source: The Swedish Police.

An additional 240 kilometres of road were equipped with automatic speed cameras in 2022. There are currently about 6 000 kilometres of road with automatic speed cameras. During 2022 there were problems with thefts of road safety cameras, but this is not deemed to have had any notable impact on the total road safety effect. The process of restoring road safety cameras to normal operation is very costly, however.

The Swedish Transport Administration has presented a commissioned proposal to the government for how adaptation of speeds to road safety standards can be improved, in which increased mobility is given greater weight. The previous objective was for the Swedish Transport Administration to have completed speed adaptations by 2025, but that has now been moved to 2030. No adaptations of speed limits to road safety standards were carried out in 2021–2022.

However, speed limits on just over 300 kilometres of road were raised to 90 km/h following an appeal. Currently there is a total of 6 620 kilometres of national road with a 90 km/h speed limit, of which 4 450 kilometres are made up of roads with a low traffic flow (an average annual daily traffic of less than 2 000 vehicles). Approximately 2 000 kilometres of planned speed limit reductions to 80 km/h were abandoned.

Because the adaptation of speed limits to road safety standards is taking longer than planned, and greater consideration is made of mobility on longer sections, it will become even more important to allocate resources to roads with median barriers. Simpler and less expensive median barrier solutions need to be developed.

As part of the ”Sustainable speeds” initiative, the Swedish Transport Administration is in dialogue with several of Sweden’s biggest purchasers of transport services, to push for the requirement that compliance with speed limits be reported in procured road transport services. In accordance with the Swedish Transport Administration’s roadmap, a pilot project is underway which will provide lessons prior to the introduction of reporting requirements in its own contracts by 2025.

Compliance with speed limits, municipal road network

	Starting point 2020	2021	Necessary level 2030	Assessed progress towards necessary level
Share of traffic volume within speed limits, municipal road network*	67 %	63 %	80 %	Not on track
Average journey speed	46 km/h	47 km/h	43 km/h	Not on track

* These measurements are not representative of the whole country, but are deemed sufficiently good to allow for tracking changes over time.

The target for the share of traffic travelling within speed limits in the municipal road network is for at least 80 per cent to comply with current speed limits in 2030. For journey speeds, the target is an average journey speed of 43 km/h by 2030. The measurement series is based on annual measurements in principal municipal road network. The series began in 2012 with 69 measurement locations, to which were added another 11 in 2021, divided between roads with speed limits of 50 km/h and 70 km/h. This means that the results for 2021 are not wholly comparable with those for previous years, but differences due to this are deemed to be minor. The aim is not to estimate the level of compliance with speed limits in a way that is representative of the whole country, but to track changes over time and indicate the approximate level.

Figure 25 shows the observed level of compliance with speed limits, i.e. the share of the traffic volume travelling within speed limits, in the municipal road network in 2021. No speed measurements were made in the principal municipal road network in 2022. The graph shows that 63 per cent of the traffic volume travelled within current speed limits in 2021, which is 4 percentage points lower than in 2020. This change is not significant, however. The outcome is 17 percentage points below the 2030 target.

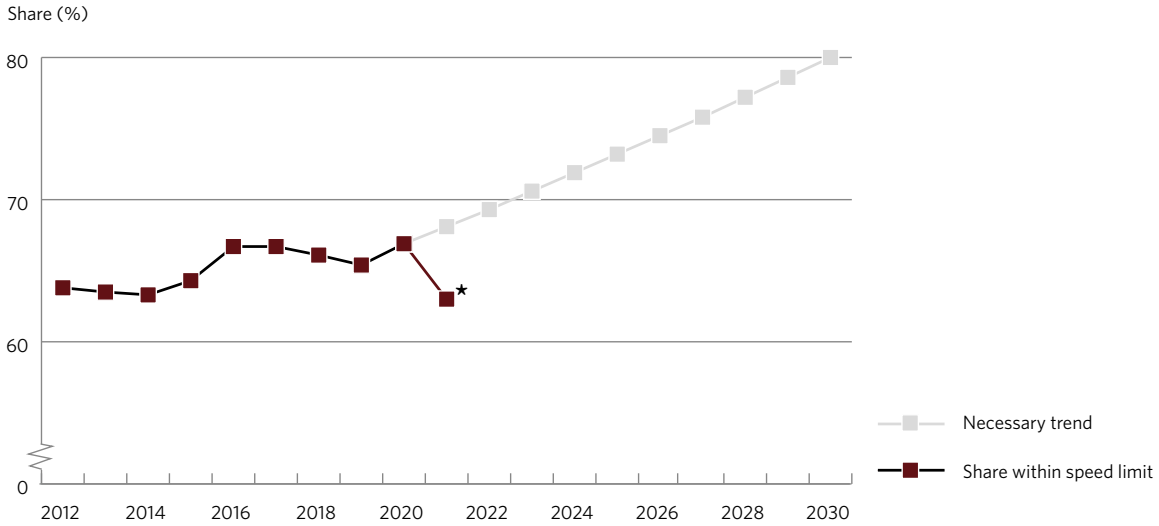

Figure 25. Share of traffic volume travelling within speed limits in the municipal road network 2012–2021, and the necessary trend towards 2030. Source: Vadeby and Anund (2022).

*11 new measuring locations along 50 km/h and 70 km/h roads added in 2021.

Figure 26 shows the average journey speed in the municipal road network in 2012–2021. In 2021 the average journey time was 47 km/h. That is slightly higher than in 2020, but the difference is not significant.

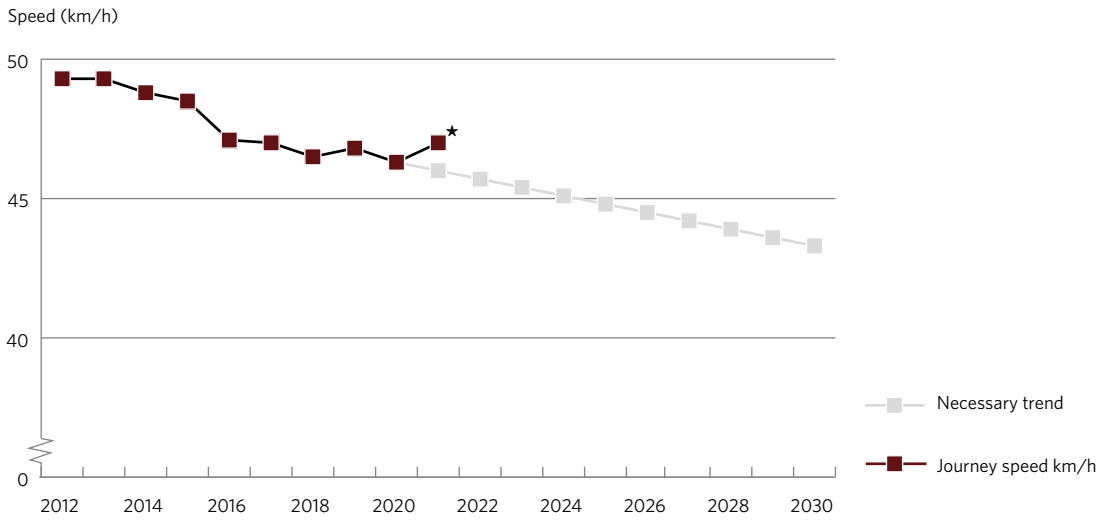

Figure 26. Average journey speed in the municipal road network, 2012–2021, and the necessary trend towards 2030. Source: Vadeby and Anund (2022).

*11 new measuring locations along 50 km/h and 70 km/h roads added in 2021.

Analysis and discussion

Figure 27 shows the results of the measurements of compliance with speed limits for 2012 to 2021, divided by speed limit. In streets with a 40 km/h speed limit, 49 per cent of the traffic travelled within the speed limit in 2021. In streets with a 50 km/h speed limit, 67 per cent complied with it; in 60 km/h streets 74 per cent; and in 70 km/h streets 78 per cent. Compliance was thus highest in streets with a 70 km/h speed limit, where the outcome is essentially on track to achieve the 80 per cent compliance target set for 2030. The measurement series began in 2012 with 69 measuring locations. 11 measuring locations, divided between 50 km/h and 70 km/h streets, were added in 2021 as many of the 50 or 70 km/h locations selected in 2012 had their speed limits changed to 40 or 60 km/h over the years. This means that the results for 2021 are not wholly comparable to those for previous years, but differences due to this are deemed to be minor. None of the changes to compliance with speed limits, considered per speed limit, is significant.

Divided by vehicle type, 62 per cent of passenger cars comply with speed limits. Among goods vehicles and buses the figure is 67 per cent, and among goods vehicles with trailers 77 per cent. The share of speeding for motorcycles and mopeds is not reported separately as the measuring equipment is unable to distinguish between motorcycles and mopeds.

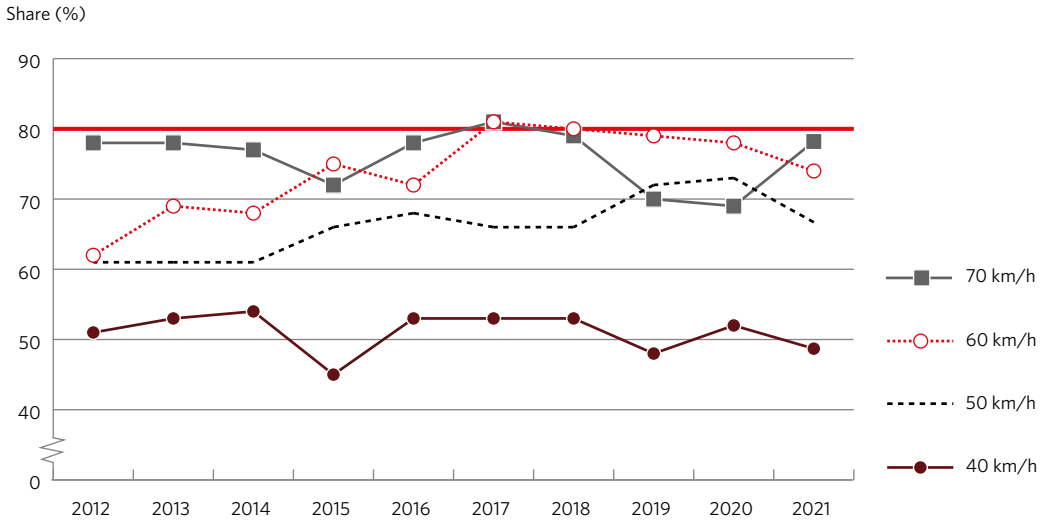

Figure 27. Share of traffic volume travelling within speed limits in the municipal road network 2012–2021, by speed limit. The red line indicates the national target of 80 per cent compliance with speed limits. Source: Vadeby and Anund (2022).

If we consider the police reporting limit, a total of 82 per cent of traffic exceeds the speed limit by up to 5 km/h, compared with 85 per cent in 2020. Compliance here is also lowest along sections with a 40 km/h speed limit, where 75 per cent of traffic exceeds the speed limit by a maximum of 5 km/h; that share is almost 90 per cent where speed limits are 50, 60 and 70 km/h. There are considerable differences overall between the measuring locations. This is probably because there are many other factors besides the speed limit that influence drivers' speed choices, such as frequency of intersections, road width, street parking and pedestrian paths.


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In order to achieve up to 80 per cent compliance with speed limits, it is above all compliance in streets with a 40 km/h speed limit that needs to be improved. Compliance can be increased e.g. through increased enforcement and adaptation of infrastructure.

Journey speeds have decreased since 2012, even if there was a small increase in 2020. Much of this is due to municipalities' efforts to lower speed limits in the municipal road network – see the section about safer streets in urban areas. Earlier research has shown that there is a 2–3 times higher risk of a pedestrian being killed if they are hit at 50 km/h than if they are hit at 40 km/h (Kröyer et al. 2014).

The Swedish Transport Administration's road safety survey from 2022 (Johansson 2022) shows that 61 per cent respondents generally find it reasonable to lower speed limits in order to increase road safety. This is a reduction by about 2 percentage points since 2020. Lowering speed limits for environmental reasons is only supported by 36 per cent of respondents, and here women (47 per cent) are also more supportive than men (27 per cent). In 2020 this was supported by a greater percentage of all respondents – 41 per cent.

Road safety cameras have proven to be effective at increasing compliance with speed limits, but this measure is rarely used today in the municipal road network. However, technology that helps the driver stay within the speed limit (ISA) can have a positive impact (see the section on safe vehicles).

Geofencing4[4] also has the potential to increase compliance and reduce the number of seriously injured and killed in urban areas (Olsson 2019). Larger trials need to be conducted in order to analyse the effect of geofenced zones on road safety.

Several studies have shown that compliance with speed limits is low among commercial drivers in urban areas (Folksam 2022, Vadeby et al. 2019). Increased compliance with speed limits in commercial traffic is deemed to have considerable potential for influencing the overall traffic rhythm as well as speeds in other categories of traffic. To contribute to increased compliance with speed limits in commercial traffic, the Swedish Transport Administration drew up a roadmap in 2021 for speed limit compliance in contract procurements. Requirements in such procurements have to be made more stringent by 2025, and will oblige the contractor to report compliance with speed limits in addition to current requirements.

4 Digital railings, which can limit the speed of connected cars, for example

Sober drivers

	Starting point 2020	2022	Necessary level 2030	Assessed progress towards necessary level
Share of traffic volume with sober drivers	Not yet established	No figure	99,9 %	Cannot be assessed

The target for sobriety on the roads is for at least 99.9 per cent of the total traffic volume to have sober drivers by 2030. Previously a measurement series based on data from police drink driving checkpoints was used to track this trend. In March 2020, however, a major change occurred in drink driving enforcement. Due to the covid-19 pandemic, a health and safety decision was made to temporarily suspend routine breath testing checkpoints. The aim was to help reduce the spread of the infection for both drivers and police personnel carrying out the checks. Breath tests continued to be carried out when there was a reasonable suspicion of an offence, but the total number of checks declined sharply in 2020 as well as 2021. In 2022 the number of checks increased again, but the total remained lower than before the pandemic.

It is reasonable to resume the measurement series from 2022 or 2023. However, since it was developed more than 10 years ago, a review of the method of estimation is needed in order to consider any changes that have occurred in e.g. working procedures and statistical tests used. Such a review is planned in preparation for next year's report. No measurement series is therefore included in this year's report.

As there is no measurement series based on police checks, results are instead reported from the Swedish Transport Administration's road safety survey. This is a survey of the general public's view of road safety based on a random sample of the population (Johansson 2022). Figure 28 shows the share of respondents stating in 2010–2022 that they had driven a car after having drunk alcohol in the past 12 months. Results vary somewhat from year to year, but there is no statistically significant trend over the period. In other words, it cannot be safely said whether the share who had driven after drinking alcohol has increased or decreased. The result in 2022 (5.4 %) is about the same as in 2020 (5.7 %).

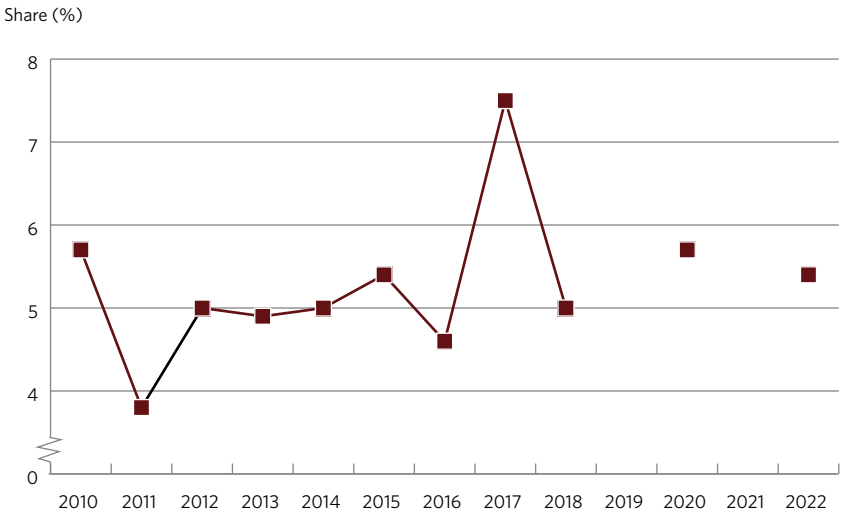


Figure 28. Share of car drivers answering Yes to the question: "Have you over the past 12 months on some occasion driven a car in connection with having drunk alcoholic beverages stronger than low-alcohol beer?". Source: The Swedish Transport Administration's Road Safety Survey 2022 (since 2018 the survey is carried out every two years).

Analysis and discussion

Preliminary results from the Swedish Transport Administration's in-depth studies of fatalities indicate that 9 of the passenger car drivers killed in 2022 were under the influence of alcohol (a blood alcohol concentration of 0.2 mg/ml or more). That is 2 fewer than in 2021, see Figure 29. Since 2019 this number has been significantly lower than in earlier years. The share also decreased, from 15 per cent in 2021 to 11 per cent in 2022. It is difficult to compare these numbers year by year as random variation is considerable; the difference between 2021 and 2022 is not statistically significant. But seen over a longer perspective, we can note a gradual reduction in both the number and share of drivers under the influence of alcohol.

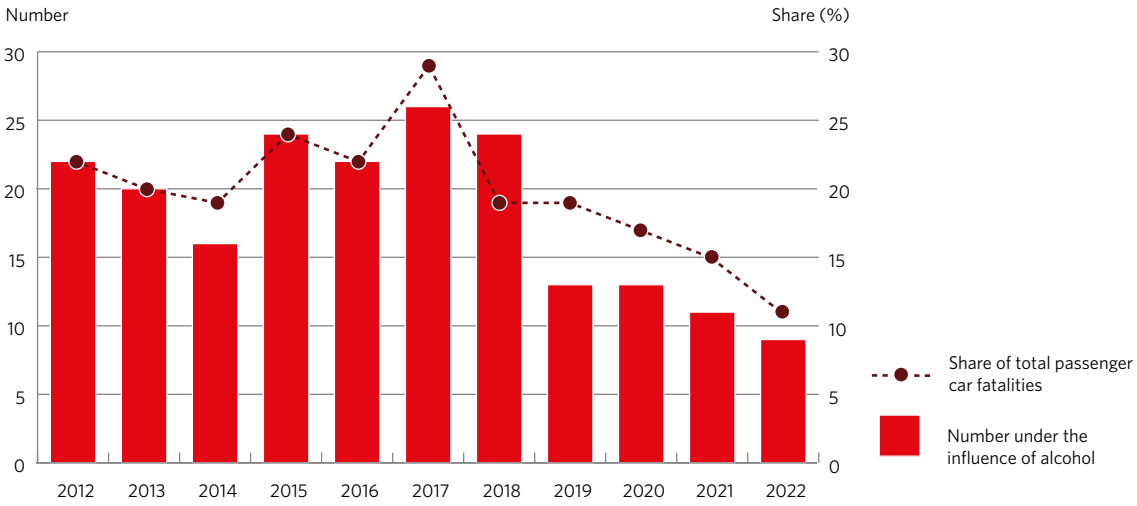


Figure 29. Number of fatalities of passenger car drivers under the influence of alcohol (a blood alcohol concentration of 0.2 mg/ml or more), and the share of passenger car driver under the influence of alcohol out of the total number of passenger car driver fatalities (right-side y axis), 2012–2022.
Source: The Swedish Transport Administration's in-depth studies.

Looking only at passenger car driver fatalities gives a limited picture of the problem, and the term ”sober driver” also means that the driver is not under the influence of any other drugs besides alcohol. Figure 30 therefore shows a time series of the number of fatalities in alcohol or drug-related accidents. An accident is regarded as alcohol or drug-related if it can be proven that alcohol or drugs were present in any of the involved motor vehicle drivers, pedestrians or cyclists. It should be noted, however, that it is often not known if a road user who has survived a traffic accident was under the influence of drugs when it happened. This means that there is a degree of uncertainty in the results.

In total there were 56 fatalities in alcohol or drugs-related accidents in 2022, which is 9 more than in 2021. As a share of the total number of road traffic fatalities in Sweden, these increased from 22 per cent in 2021 to 25 per cent in 2022. Of the 56 fatalities in 2022, alcohol alone featured in 32, drugs alone featured in 16, and alcohol as well as drugs featured in 8 of the fatalities.
If we look at the entire period from 2012, the number of fatalities in alcohol-related accidents has decreased while the number of drugs-related fatalities is now back at about the same level as it was at the beginning of the period, after a few years of relatively high numbers between 2016 and 2018.

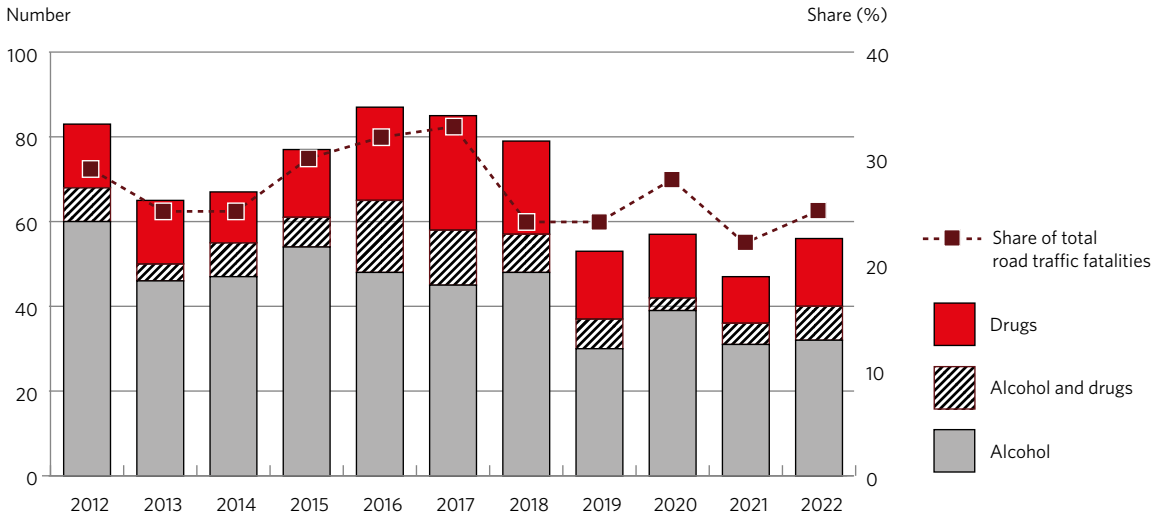


Figure 30. Number and share (of the total number of fatalities in Sweden, right-hand axis) of fatalities in alcohol and/or drugs-related accidents, 2012–2022.
Source: The Swedish Transport Administration’s in-depth studies.

Figure 31 illustrates how fatalities over the past five years in accidents related to alcohol and drugs, respectively, were divided by mode of transport. It shows that the biggest group in both alcohol and drugs-related accidents is occupants. The second and third-largest groups of fatalities in alcohol-related accidents were motorcyclists and others. Fatalities of pedestrians, cyclists and moped riders had about equal shares. The share of motorcyclists is considerably larger in drugs-related accidents than in alcohol-related accidents – 29 per cent compared with 13 per cent.

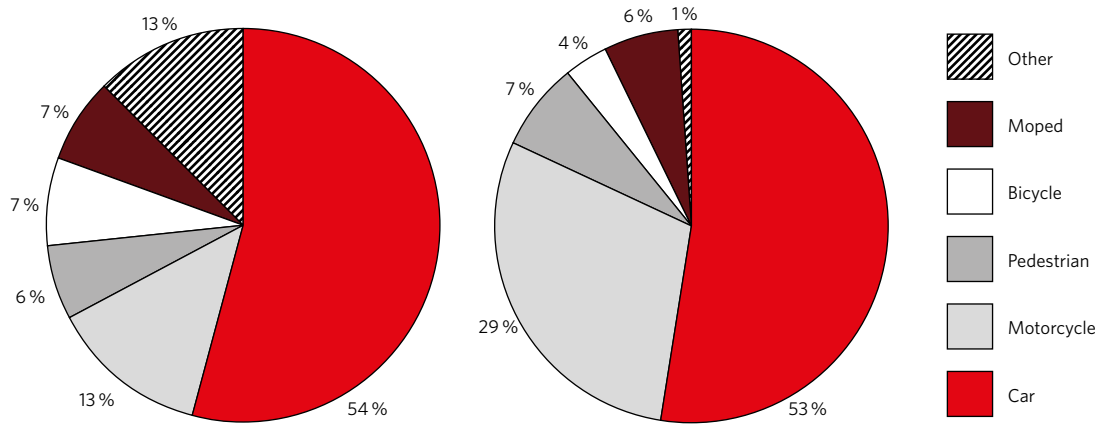


Figure 31. Share of fatalities in alcohol-related (left pie chart) and drugs-related accidents (right pie chart), by mode of transport. Accidents that were both alcohol and drugs-related are included in both pie charts. The distribution is based on all fatal accidents during the 2018–2022 period.
Source: The Swedish Transport Administration's in-depth studies.

IFigure 32 shows the number of breath tests carried out by the police in relation to the number of reported drink-driving offences during the 2010–2022 period. Both the number of breath tests and the number of reported drink-driving offences relating to alcohol increased in 2022 compared with 2021, and the level is approaching that before the covid-19 pandemic, even if it still has some way to go. When the number of reported drink-driving offences decreased in 2020 there was instead an increase in the number of reported drugs-driving offences, which indicates that the police changed the focus of their enforcement. The number of reported drugs-driving offences then fell in 2021 and 2022. In 2021 there were about 8 200 drink-driving offences and about 14 200 drugs-driving offences reported; in 2022 this changed to 10 400 drink-driving offences and 12 700 drugs-driving offences (preliminary figures). The share of drug-driving offences in all reported offences of drivers under the influence of substances varies between the different police regions, from 48 per cent in Region North and Region Stockholm to 70 per cent in Region Centre.

The number of instituted legal proceedings for drink-driving offences is quite a lot lower than the number of reported such offences, and the ratio varies for alcohol and drugs. For offences related to drugs the share of prosecutions was about half of reported crimes in 2021, while for alcohol-related offences the number of prosecutions was about one fifth fewer than the number of reported offences.

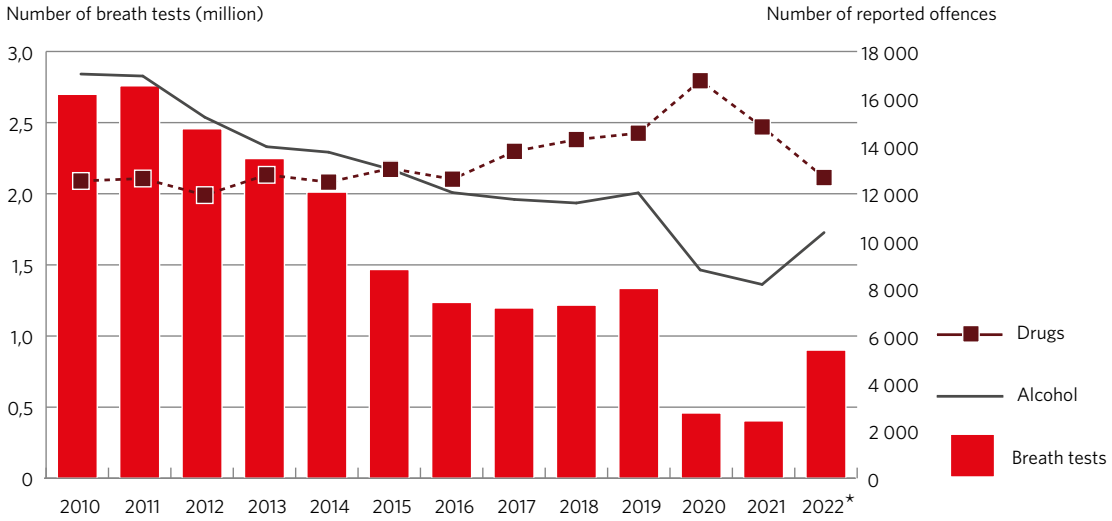


Figure 32. Number of breath tests and number of reported drink-driving offences for alcohol and drugs, respectively, 2010–2022.

*The number of tests in 2022 is an upward adjustment, and an estimate of the definitive number of tests. The number of reported offences for 2022 is preliminary.
Source: The Swedish Police and BRÅ

Since 2019 there has been a reduction in the number of fatalities of passenger car drivers under the influence of alcohol, but this reduction does not apply to the total number of fatalities in alcohol-related accidents. The share of fatalities occurring in alcohol-related accidents has also remained fairly constant over the past five years. If we go farther back in time there is even a slightly decreasing trend, but the share of fatalities in drugs-related accidents has not decreased in the same way. Continued measures to reduce drink-driving and its consequences are therefore necessary.

The Swedish Transport Administration works in different ways to counter drink—driving. New course materials about alcohol and drugs in traffic was launched in 2022 for use in teaching Years 7–9 and upper secondary school5[5]. The Swedish Transport Administration also imposes requirements for alcohol interlock devices in procurements within its contracting activities – these requirements apply for all light and heavy vehicles as well as machinery that can be driven at speeds in excess of 30 km/h. Requirements for alcohol interlock devices also exist for all government agencies' official cars6[6] and for various types of transport with other organisations, e.g. the City of Gothenburg (Swedish Transport Administration 2022). MHF (Motorförarnas Helnykterhetsförbund, or the Union of Temperance Drivers of Sweden) is campaigning for more municipal and regional stakeholders to introduce requirements for alcohol interlock devices or similar when procuring travel and transport services.

Alcohol interlock devices and other sobriety-promoting technologies are still unusual among private occupants overall. A new generation of sobriety-promoting technology has been developed over a number of years, for aftersales installation as well as production-line integration into the vehicle. This new technology is expected to be available for aftersales installation in Europe during the course of 2023 (Swedish Transport Administration 2022). This is a positive development, but in order for the technology to have an impact there has to be a demand for it from road users.

5 https://gratisiskolan.se/amne

6 Förordning (2020:486) om miljö och trafiksäkerhetskrav för myndigheters bilar: https://www.riksdagen.se/sv/dokumentlagar/dokument/svenskforfattningssamling/forordning2020486ommiljooch_sfs2020486

Seat belt use

	Starting point 2020	Outcome 2021	Necessary level 2030	Assessed progress towards necessary level
Share of front seat passenger car occupants wearing a seat belt	96 %	95.7 %	99.5 %	Not on track

The target for seat belt use is for at least 99.5 per cent of all drivers and front seat passengers in passenger cars to be wearing a seat belt by 2030.

The documentation used to track progress consists of observational measurements by NTF (Nationella trafiksäkerhetsförbundet, or the National Society for Road Safety). The indicator is defined as the share of seat belt-wearing occupants in the front seats of passenger cars. This share is calculated on the basis of observed drivers and front seat passengers. It considers the average occupancy of passenger cars, which is why passengers are allotted less weight when the overall share wearing a seat belt is computed. The measurement is based on 350 000 observations of drivers and passengers in urban areas of all Sweden's 290 municipalities. No measurements were made in 2022, which is why measurement results from 2021 are used in this report.

In the earlier follow-up of the seat belt indicator (interim target 2020), measurements were used that more reflected through traffic. The measurement result was based on observations of 30 000 passenger cars at major roundabouts in six medium-sized Swedish urban areas. These observations also included heavy goods vehicles, which is not the case in NTF's observations.

Trend and progress towards the 2030 target

The rate of seat belt use in the front seats of passenger cars was 95.7 per cent in 2021 (most recent available data), which means that use has decreased somewhat compared to 2020, when it was 96 per cent. The outcome for 2021 is not quite on track towards the necessary level.

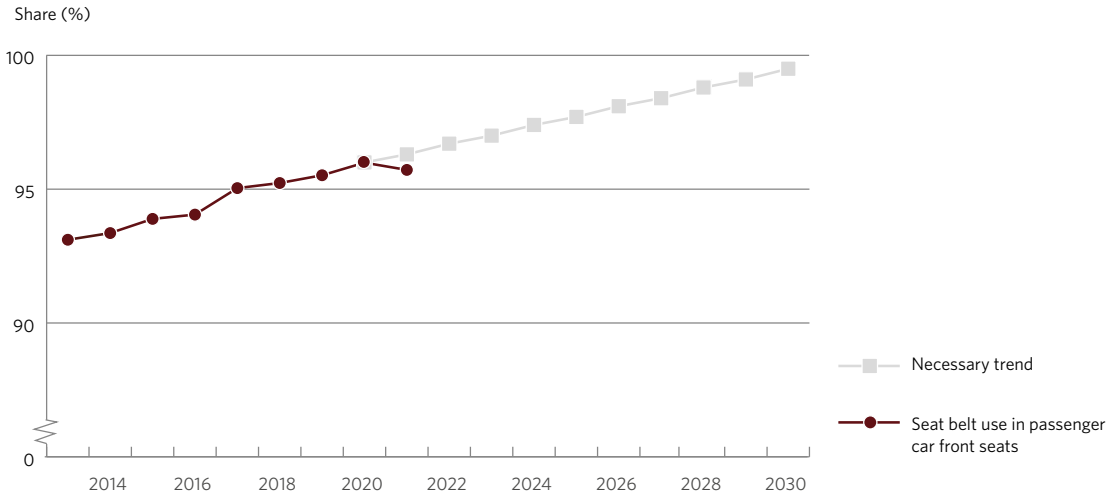


Figure 33. Share of individuals in passenger car front seats who were wearing a seat belt when they were observed, 2013–2021, and the necessary trend until 2030.
Source: NTF (2013–2021).

Analysis and discussion

Since measurements began in 2013 we see that total seat belt use has improved somewhat each year, except for in 2021, when use instead decreased on that of the previous year, see Figure 33. The pattern is largely the same for drivers and front seat passengers. Overall, seat belt use increased by 2.7 percentage points from 2013 to 2021. The outcome of 95.7 per cent in 2021 is about one percentage point below the necessary trend towards 2030.

Overall use by drivers was 95.7 per cent in 2021, see Figure 34. Seat belt use among female drivers is just over 3 percentage points higher than among male drivers – 97.9 per cent compared with 94.6 per cent. Among male drivers, seat belt use has increased by 3.4 percentage points since 2013, while it has increased by 1.6 percentage points among female drivers.

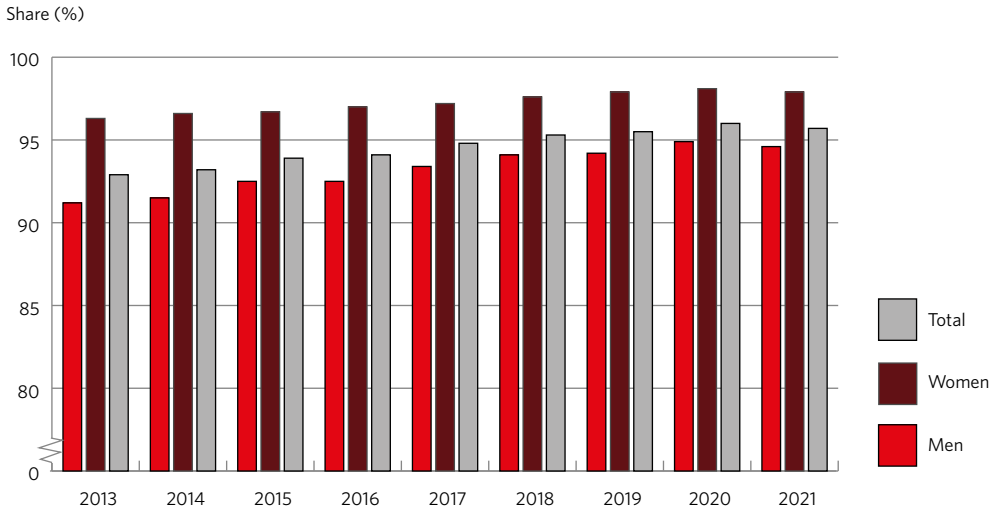


Figure 34. Seat belt use by drivers 2013–2021, overall and among men and women respectively. Source: NTF

Seat belt use among front seat passengers was 95.6 per cent in 2021, see Figure 35. That is an increase overall by 2 percentage points on 2013, when overall use was 93.9 per cent. Seat belt use among female front seat passengers is the same as it was in 2020, 97.9 per cent, while for male front seat passengers it is 0.6 percentage points lower than it was 2020, 92.6 per cent. Children aged 4–15 in the front passenger seat show seat belt use of 98.7 per cent, which is an increase by 0.2 percentage points on 2020.

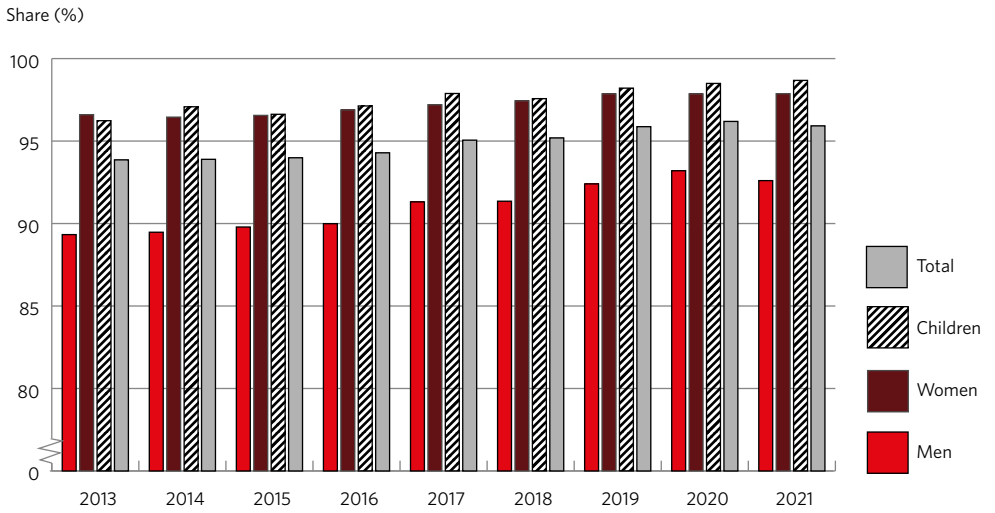


Figure 35. Seat belt use by front seat passengers 2013–2021, overall and among men, women and children aged 4–15, respectively. Source: NTF.

Despite the relatively large share of drivers who wear seat belts, about a third of all passenger car driver fatalities are of drivers not wearing seat belts. This has been the case for a long period of time; in 2022 their share was 30 per cent, which corresponds to 24 drivers not wearing seat belts, see Figure 36.

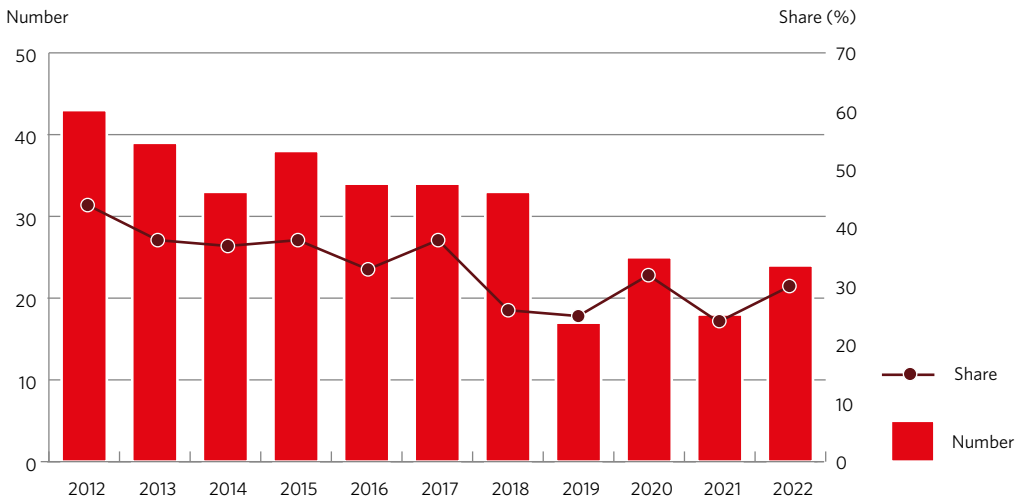


Figure 36. Number of passenger car driver fatalities not wearing seat belts at the time of the accident, and their share of drivers known to wear seat belts, 2012–2022.
Source: The Swedish Transport Administration's in-depth studies.

Of driver fatalities not wearing seat belts in 2022, 67 per cent were travelling in cars manufactured before 2009, which was the year in which seat belt reminders became standard among new cars in Sweden. Seat belt reminders that were more advanced than the early, very simple varieties, began to be introduced in 2003. If we consider cars from model year 2003 or later, 64 per cent of the fatalities were travelling in cars with seat belt reminders. However, if we look at the distribution of drivers wearing seat belts and drivers not wearing seat belts in newer cars, it is clear that seat belt use in newer cars is greater, see Figure 37.

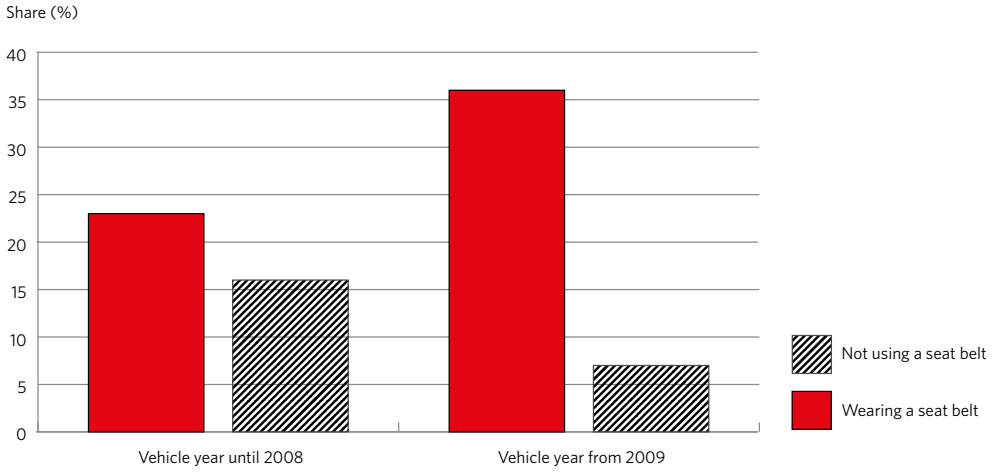


Figure 37. Seat belt use among passenger car driver fatalities, divided by vehicle manufacturing year, 2022. Source: The Swedish Transport Administration's in-depth studies.

The share in the total traffic volume of vehicles with seat belt reminders was estimated at 99 per cent in 2022; in 2005 the share was 10 per cent. A measurement carried out by the Folksam insurance company showed that seat belt use with seat belt reminders remains at a high level. Even if the country's vehicle fleet does not consist to 100 per cent of vehicles with seat belt reminders, the introduction of seat belt reminders is calculated to have contributed to a great extent to increasing seat belt use.

Seat belts don't save everyone, but many lives could still be saved if the already considerable share of general seat belt users grew even further.

Helmet use

	Starting point 2020	2021	Necessary level 2030	Assessed progress towards necessary level
Share of observed cyclists wearing a helmet	43 %	46 %	80 %	On track
Share of observed moped riders wearing a helmet	97 %	98 %	100 %	On track

The target for bicycle helmet use is for at least 80 per cent of cyclists to be using a helmet by 2030. The indicator used to gauge bicycle helmet use is the share of cyclists observed wearing a helmet in annual measurements carried out by NTF (NTF 2021). The measurements are not intended to estimate overall helmet use in Sweden in a representative way, but are good enough to provide a picture of changes over time and of the approximate level of use. No measurements were carried out in 2022, which is why measurement results from 2021 are used in this report. The measurements in 2021 were based on around 110 000 observations from all of Sweden's 290 municipalities.

Another measurement series was used earlier to track levels of helmet use towards the 2020 interim target, but since 2021the measurement series presented in this report has been used.

In addition to bicycle helmet use, the use of helmets by moped riders is also studied. Observations to this end are carried out in the same locations and at the same times as the observations of bicycle helmet use (NTF 2021). Only those riders who are seen to have their helmets properly fastened are counted as helmet users. The target for moped helmet use is for 100 per cent of moped riders to be using helmets by 2030. For motorcyclists our assessment is that the level of helmet use is very high, and that the potential for saving lives lies in other measures.

Bicycle helmets

Figure 38 shows how observed bicycle helmet use evolved between 2013 and 2021. Observed bicycle helmet use was at 46 per cent in 2021, which is an increase by 3 percentage points on 2020. The figure also shows how bicycle helmet use needs to change in order for the target level of 80 per cent to be attained. The actual level of bicycle helmet use is currently 34 percentage points below the target level of 80 per cent in 2030.

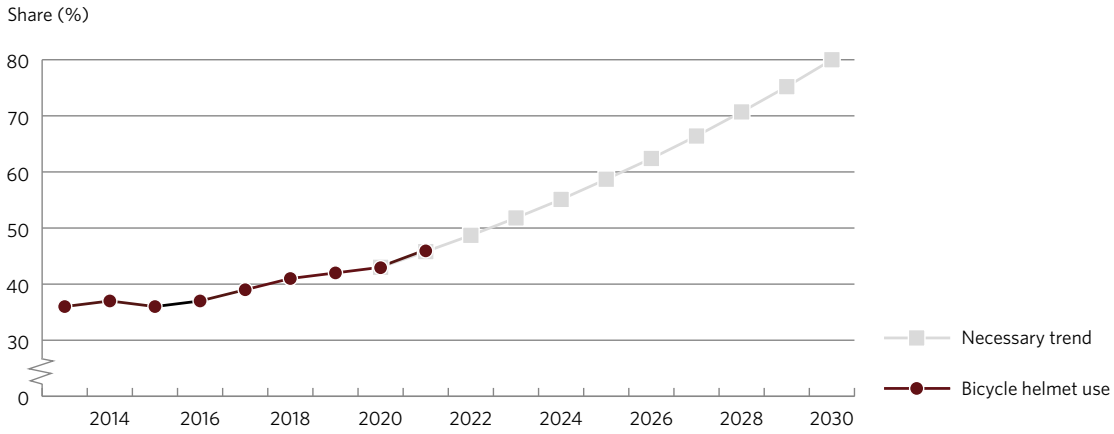


Figure 38. Share of observed cyclists wearing a helmet 2013–2021, and the necessary trend. Source: NTF (2021).

Analysis and discussion – bicycle helmets

Bicycle helmet use in Sweden is at quite a modest level, particularly among adults, and there is considerable potential for increasing use. Figure 39 shows that observed bicycle helmet use in 2021 was just over 64 per cent for children up to the age of 15 and 42 per cent for adults (men 41%, women 42%). Compared with 2020 measurements there has been a slight increase in use.

Helmet use among children is 3 percentage points higher near schools (65%) than along cycle routes (62%). 87 per cent of schoolchildren aged 6–12 used a bicycle helmet, while use was much lower among teenagers in school (39%).

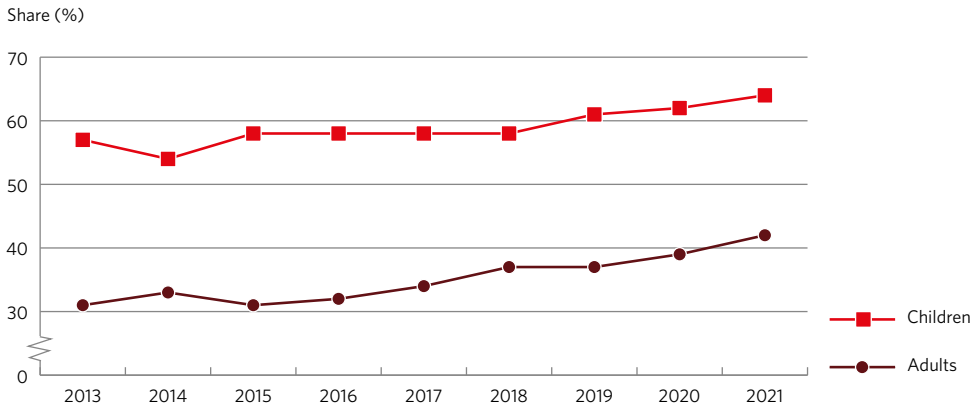


Figure 39. Bicycle helmet use by different groups, 2013–2021. Source: NTF (2021).

Bicycle helmet use is also measured in the road safety survey (Johansson 2022), where 36 per cent of respondents state that they always or almost always wear a bicycle helmet when cycling. This is a small increase on 2020, when that share was 35 per cent.

In 2022 there were 26 traffic fatalities of cyclists. Studies from previous years show that almost half of very seriously injured cyclists sustained a head injury, while only about ten per cent of seriously injured cyclists did. It follows that bicycle helmets are effective above all in preventing more serious injuries. If all cyclists wore bicycle helmets, the total number of seriously injured cyclists could be reduced by 5 per cent, and the number of fatalities by 25 per cent.

According to Rizzi et al. (2013), bicycle helmet use can reduce the number of serious head injuries by 58 per cent, and the number of very serious head injuries by 64 per cent. A meta-analysis by Elvik (2013), based on 23 different studies, indicates that bicycle helmets reduce head injuries by 50 per cent. Olivier and Creighton (2017) report effects on the same order of magnitude as Elvik.

Several campaigns to increase voluntary helmet use are ongoing in Sweden, see e.g. Forward et al. (2020). The main message of one such campaign was "Mind your brain when cycling". After the campaign was completed, 80 per cent of the intended recipients reported that they found the message important, credible and clear.

Several projects were initiated in 2021 and 2022 around safe cycling, of which helmet use is a part. One project, led by NTF, will collaborate with around 20 municipalities where cycling is being promoted. The goal is to highlight the need for special activities for increased helmet use in c ombination with measures to improve cycling infrastructure, while also encouraging more people to cycle.

Today there are fewer than 30 countries with any type of bicycle helmet legislation. A literature review by Olivier et al. (2018) looked at the effects of bicycle helmet legislation. They found that the literature does not support the argument that making helmets compulsory would lead to reduced cycling, or that it indicates a tendency to greater risk-taking by helmet users.

Bicycle helmet use increased by 3 percentage points between 2020 and 2021. No new measurements were made in 2022. Based on the measurements from 2021, the analysis group makes the assessment that the trend is on track towards the necessary level in 2030.

Moped helmets

Figure 40 presents observed moped helmet use between 2013 and 2021. It shows that observed moped helmet use was 98 per cent in 2021, which is one percentage point higher than in 2020.

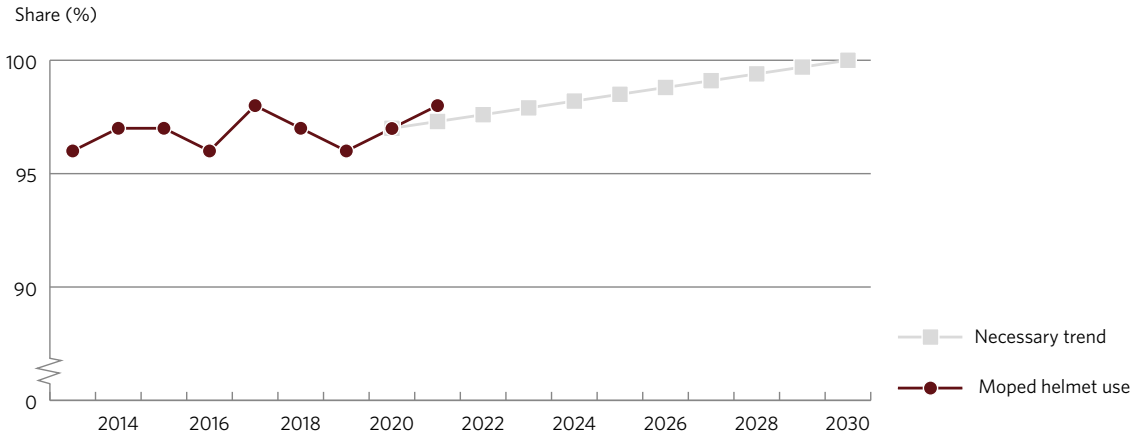


Figure 40. Share of observed moped riders who were wearing a helmet 2013–2021, and the necessary trend towards 2030. Source: NTF (2021).

Analysis and discussion – moped helmets

Although helmet use among moped riders is relatively high overall, the use of helmets among moped rider fatalities is only around 50 per cent. During the period 2010–2022 a total of 62 moped riders were killed,, and on average almost 50 per cent of these were not wearing a helmet or had lost it at the time of the accident. The Swedish Transport Administration's policy document "Inriktning för säker trafik med cykel och moped" ("Policy direction for safe cycling and moped riding", Swedish Transport Administration 2018) highlights increases and correct helmet use as a priority area for measures. It also notes that most of those who had lost their helmets at the time of the accident were under 18 years old, and estimates that if all moped riders used their helmets correctly, two lives could be saved per year on average (compared with the 2012–2014 baseline).

In 2022 there were 11 moped rider fatalities in traffic, which is a clear increase on 2021. Earlier statistics show that just under 40 per cent of all very seriously injured moped riders sustained a head injury, while less than 10 per cent of seriously injured moped riders did. It follows that increased helmet use among moped riders has the potential primarily to reduce the number of very seriously injured riders. Calculations show that helmet use reduces the risk of serious injury by 17 per cent and of very serious injury by 47 per cent.

Moped helmet use increased by one percentage point between 2020 and 2021. No new measurements were made in 2022. Based on the measurements from 2021, the analysis group makes the assessment that the trend is on track towards the necessary level by 2030.

External factors

This chapter describes some external factors which may be useful to consider when interpreting trends in the numbers of fatalities and injured. In this context, an external factor is one that affects road safety but which lies beyond what can be influenced in actual road safety work. Some external factors, such as the weather, can have a direct impact on road safety. Other factors, including the age structure of the population and the economic outlook, affect the mix of different modes of transport, which in turn affects the trend for the number of fatalities and injured in road traffic. Moreover, different external factors affect the number of fatalities and injured across different time horizons. The economic outlook and the age structure of the population are both factors that change relatively slowly and thus cause changes in the mix of transport modes over intermediate periods of time (5-10 years). The weather causes seasonal variations, but can also have an impact almost immediately (e. g. roads turning slippery in a cold snap) as well as in the longer term (e. g. climate change).

The covid-19 pandemic in 2020 also became a significant external factor. Not least, the total traffic volume was influenced by restrictions and recommendations introduced during the pandemic. This effect was greatest during 2020, after which a gradual recovery has taken place.

Table 3 shows how traffic volumes in the national road network changed annually between 2019 and 2022, based on data from the traffic variation monitoring points where the Swedish Transport Administration continuously measures the number of passing vehicles. The results show that total traffic declined by almost 9 per cent between 2019 and 2020, to then grow by 4.2 per cent in 2021 and by another 2.8 per cent in 2022. Over the period as a whole (since 2019), total traffic declined by 2.4 per cent. If we look only at heavy vehicle traffic we see that it was much less affected by the pandemic; it grew by 3.2 per cent from 2019 to 2022. Note, however, that there is considerable uncertainty in the change between 2021 and 2022, compared with earlier, and that the change is not statistically significant, either for light or heavy vehicles.

Table 3. Relative change (per cent) in traffic volume in the national road network, all road categories. The ± figure is the confidence interval with a 95 per cent level of confidence. Source: Trafikarbetets Förändring ("Changes in traffic volume", Swedish Transport Administration)[7].

	Change 2019–2020	Change 2020–2021	Change 2021–2022
Light vehicles	-9,9 ± 2,0	4,1 ± 1,2	3,5 ± 4,0
Heavy vehicles	-1,5 ± 1,4	5,7 ± 1,3	-0,9 ± 2,2
Total traffic	-8,9 ± 1,9	4,2 ± 1,1	2,8 ± 3,5

7 https://applikationpt.trafikverket.se/ID76/trafikarbetetsforandring.html

The change in traffic volume between 2021 and 2022 is shown in Table 4, by road category. For light vehicles the increase occurred on European routes and principal national roads. It was also mainly on these road categories that the decline between 2019 and 2020 occurred. The increase on principal national roads must be interpreted with caution, however, due to the large confidence interval. One reason for the considerable uncertainty is that the trend has varied between different measuring locations. The change in traffic volume for heavy vehicles does not vary as much between road categories as it does for light vehicles.

Table 4. Relative change (in per cent) in traffic volume on national roads in 2022, compared with 2021. The ± figure is the confidence interval with a 95 per cent level of confidence. Source: Trafikarbetets Förändring ("Changes in traffic volume", Swedish Transport Administration).

Road category	Light vehicles	Heavy vehicles
European routes	3,4 ± 1,6	-0,7 ± 3,9
Principal national roads	9,1 ± 15,5	0,2 ± 2,2
Main county roads	-0,6 ± 3,1	-1,8 ± 1,1
Other county roads	0,6 ± 6,8	-1,8 ± 6,5
All road categories	3,5 ± 4,0	-0,9 ± 2,2

Car traffic in the biggest cities declined or remained unchanged in 2022, compared with 2021. In Stockholm car traffic declined by about 3 per cent if we consider the average number of vehicles passing toll charge points into Stockholm's inner city on normal weekdays (between 06.30 and 18.30)8[8]. In Gothenburg traffic volume is also monitored at toll charge points. Car traffic declined within what is referred to as the congestion tax boundary by just under 1 per cent on weekdays, according to calculations by the City of Gothenburg (2023). Measurements in the central parts of Malmö showed that car traffic over weekdays was largely unchanged between 2021 and 20229[9]. Car traffic has declined in all three cities compared with 2019 – by about 8 per cent in Stockholm and about 5 per cent in Gothenburg and Malmö. The number of registered passenger cars in circulation on the last day of the year was the same in 2022 and in 2021 – 5.0 million.

Figure 41 shows the total traffic volume in Sweden per year, from 2010 and onwards.10[10] It clearly shows the decline that occurred in 2020, during the first year of the covid-19 pandemic. That decline meant that the traffic volume returned to the level it had during the first years of the 2010s. Data for 2022 are not available yet; instead the figure has been adjusted upwards by the estimated change of total traffic in the national road network.

8 https://miljobarometern.stockholm.se/trafik/motorfordon/trangselskattesnittet/table/

9 Personlig kommunikation: Stephanie Judge, Malmö Stad

10 https://www.trafa.se/vagtrafik/trafikarbete/

The evolution of the traffic volume, divided by vehicle type, from 2010 and onwards is shown in Figure 42. The dominant vehicle type is passenger cars, which represent about 80 per cent of the total traffic volume on Swedish roads. Here we also see that the decline in 2020 was greatest among passenger cars, while the traffic volume of goods vehicles only declined marginally. Bus traffic also declined considerably in 2020 – even more than passenger car traffic, in relative terms. If we consider the overall development from 2010 until 2021, the greatest increase in traffic volume was of light goods vehicles – 28 per cent. Heavy goods traffic increased by 7 per cent and passenger car traffic by 2 per cent. The traffic volume of motorcycles declined by 13 per cent, and that of buses by 5 per cent. If we include the preliminary figures for 2022, passenger car traffic has increased by 5 per cent and heavy goods vehicle traffic by 6 per cent compared to 2010.

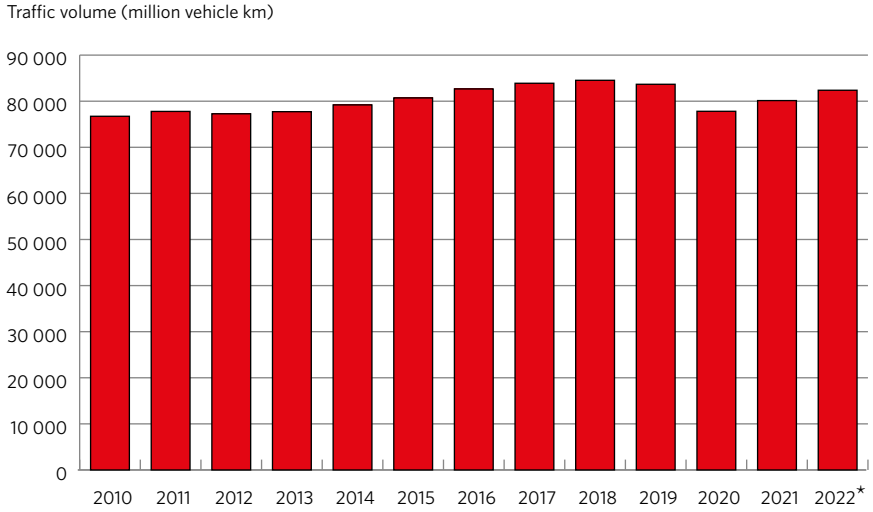


Figure 41. Total traffic volume per year, 2010–2022. Source: Trafikanalys.

*Data for 2022 are preliminary and have been adjusted upwards using the Swedish Transport Administration's change factor for total traffic.

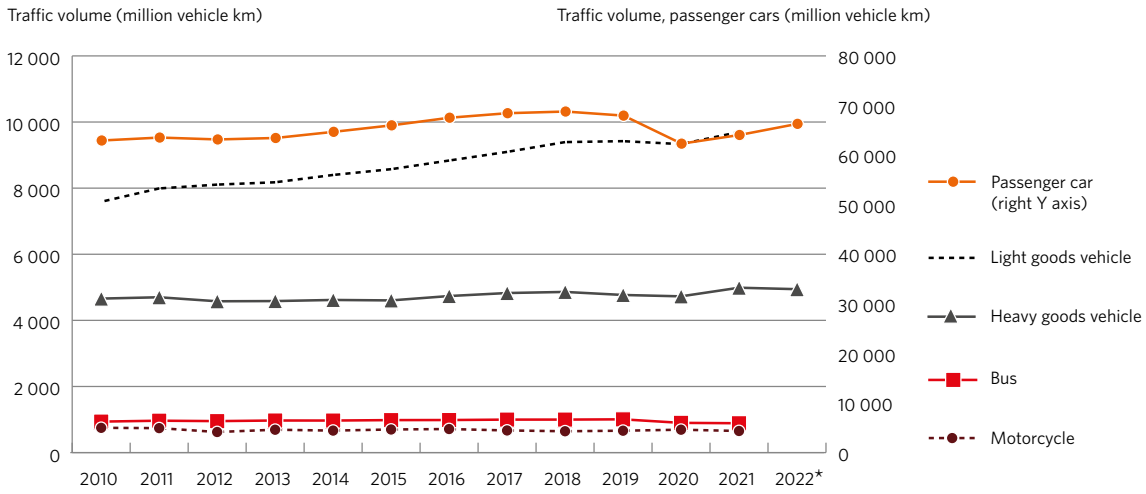


Figure 42. Traffic volume per vehicle type, 2010–2022. Note that the traffic volume of passenger cars is shown on the right-hand y axis. Source: Trafikanalys.

*Data for 2022 are preliminary and have been adjusted upwards using the Swedish Transport Administration's change factors for light (passenger car) and heavy vehicles. No upward adjustment has been made for light goods vehicles, motorcycles and buses, since relevant change factors are not available.

Even if the traffic volume of motorcycles declined between 2010 and 2021, the number of motorcycles in circulation has grown each year (as per 30 June) during the same period; in total, the increase is just under 10 per cent. Motorcycle registrations increased by a further 0.5 per cent between 2021 and 2022, and on 30 June 2022 there were approximately 335 000 motorcycles in circulation. The number of Class I mopeds (designed for a maximum speed of 45 km/h) in circulation increased by 3 per cent between 2021 and 2022, from about 138 000 to about 142 000.

Trafikanalys have also published data on the number of registered quad bikes/ATVs and A tractors 11[11]. The Swedish Road Traffic Registry classifies quad bikes/ATVs as Class I mopeds, meaning they cannot be distinguished from other Class I mopeds in the statistics. Trafikanalys have therefore estimated their number via makes and displacement, and concluded that there were around 13 600 quad bikes/ATVs in circulation in 2022, and around another 3 400 that were deregistered. Quad bikes/ATVs make up about 13 per cent of all Class I mopeds in circulation (as per 31 December 2022). The number of quad bikes/ATVs in circulation has more than doubled since 2016.

A tractors are registered as tractors but have their own body code which means they can be distinguished in the statistics. There were 35 000 registered A tractors in circulation at the end of 2022, and another 17 600 that were deregistered. The number of A tractors has increased sharply in recent years, particularly since 2020, when a regulatory change made it easier to convert cars into A tractors. At the end of 2019 there were 13 000 A tractors in circulation.

11 https://www.trafa.se/vagtrafik/hurmangamopedbilarochatraktorerfinns det11202/

The total traffic volume of bicycles, and changes to it, are difficult to estimate as no national observation measurements are made. There is some documentation available, however. For example, Sweden's three biggest cities carry out measurements which are relatively extensive. Cycling increased in all three cities in 2022, compared with 2021. In Stockholm the number of passages across the inner city boundary increased by 9 per cent[12], and in Gothenburg the increase was estimated at around 13 per cent (City of Gothenburg 2023). The increase in central parts of Malmö was as big as 18 per cent in 2022, but cycling there is still below its 2019 level, before the covid-19 pandemic[13]. Cycling in Stockholm and Gothenburg is estimated to have increased in 2022 compared with 2019.

A total of around 430 000 bicycles were sold in 2021/2022 (1 September–30 August), which is less than the approximately 460 000 sold during the same period in 2020/2021. The number of electric bicycles sold increased by about 4 per cent, however – from 90 000 to 94 000 – and made up just over 20 per cent of all bicycles sold in 2021/2022. The sale of electric bicycles was at its current peak in 2017/2018, when around 103 000 were sold. An electric bicycle premium was offered that year, which meant that you could get a subsidy amounting to a maximum of 25 per cent of the bicycle's price (maximum SEK 10 000), and this contributed to the bumper sales.

The age structure of the population also affects road safety, as people of different ages choose different modes of transport and evince different behaviours, e.g. in risk-taking in traffic. The human tolerance to blunt force, for example, also varies with age. Figure 43 shows changes to age structure of the population between 2010 and 2022.

Age structure changes happen very slowly, but the 75+ age group grew in relation to the other groups between 2021 and 2022, while the 0–17 and 65–74 groups declined somewhat. The remaining age groups only changed marginally. Seen from a longer perspective, since 2010, it was also the 75+ group that grew most – by 1.8 percentage points. The biggest decline was in the 18–24 group, by 1.7 percentage points.

In total the population grew by 12 per cent between 2010 and 2022. This increase can be seen in all age groups except the 18–24 group, which instead declined by 8 per cent. However, that group began to grow again in 2021 and 2022.

12 .https://miljobarometern.stockholm.se/trafik/cykeltrafik/ antalcykelpassager/table/

13 Stephanie Judge, Malmö Stad

The age group with the highest risk of being killed on the road is the 75+ group, and this applies regardless of whether we consider travel distance (Trafikanalys 2011) or the size of the population (Trafikanalys 2022). This higher risk of fatal accidents among the elderly may be because they are frailer in the event of accident, as well as the fact that they are often vulnerable road users, among other reasons. The second-highest risk group is the 18–24s, and here it is primarily the men who represent the risk. The number of people aged 75 and over grew by 35 per cent between 2010 and 2022, which may have contributed to more fatalities. However, the share of the population aged 18–24 declined by 8 per cent during the same period, which may have compensated for the increased number of elderly people, but only to a certain extent. The group with the lowest risk of being killed on the road is the 0–17 group. The share of the population in that group was about the same in 2010 as in 2022.2.

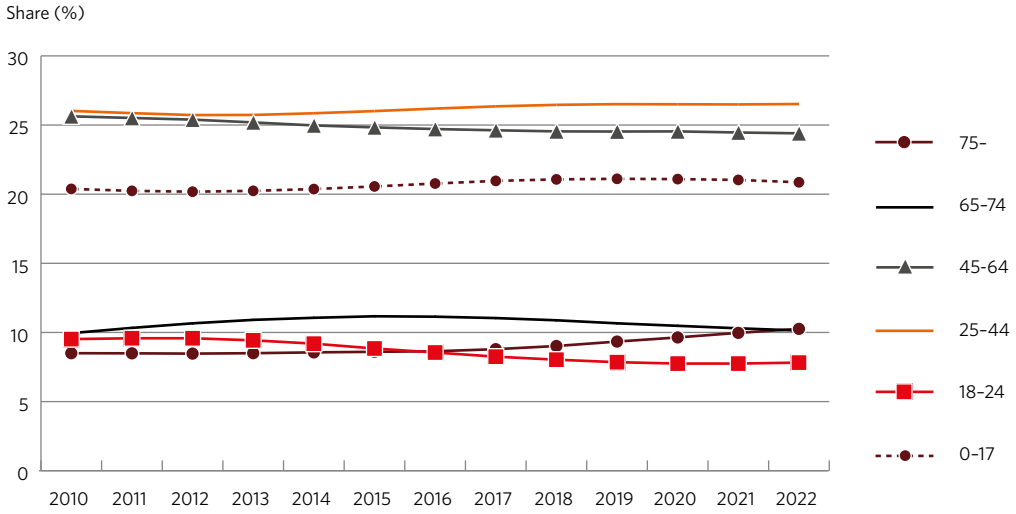


Figure 43. Age distribution of the population, 2010–2022. Source: Statistics Sweden.

Experiences from several countries indicate that there is a link between the number of traffic fatalities and the state of the economy. An economic downturn is often followed by a reduction in fatalities (Irtad 2015). This may be due to some extent to the decline in travel associated with a recession, but that is only a partial explanation. There are a number of hypotheses about the relationship between the state of the economy and road safety, most of which have to do with changes in patterns of travel. Still, there are probably several different factors capable of influencing road safety positively as well as negatively, so it is very difficult to untangle causal relationships.

The economy was greatly influenced by the covid-19 pandemic, but only during a fairly brief period. A major slowdown occurred during the second quarter of 2020, which was followed by a recovery during the third quarter of the same year. Sweden then had economic growth until the first quarter of 2022, when GNP declined slightly. It then grew in the second and third

quarters of 2022 before declining slightly again in the fourth quarter. Due to factors including high inflation and interest rate increases, Konjunkturinstitutet (the National Institute of Economic Research) predicts that Sweden will enter recession during 2023.

Unemployment figures are often use as a measure when studying the relationship between road safety and the state of the economy. Figure 44 shows unemployed people as a share of the total available labour force aged 15–74, according to Statistics Sweden's labour force studies (Arbetskraftsundersökningarna, AKU). Unemployment decreased from an annual average of 8.8 per cent in 2021 to 7.4 per cent in 2022. This means that unemployment is almost as low as it was in 2019, before the covid-19 pandemic. Based on previously observed causal relationships, the low unemployment figures in 2022 might have a negative effect on road safety.

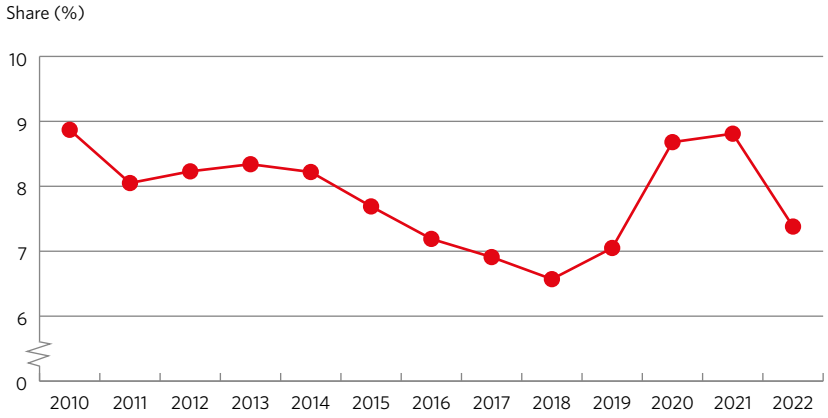


Figure 44. Unemployed people as a share of the population aged 15–74, 2010–2022.
Source: Arbetskraftsundersökningarna (AKU), Statistics Sweden.

Conclusions and discussion

Fatalities, not on track towards the necessary level

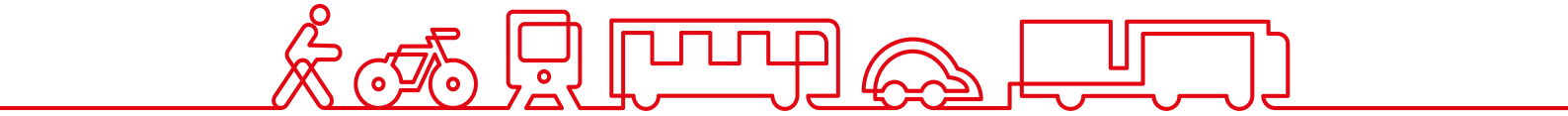
In 2022 there were 227 fatalities in road traffic accidents. That is an increase by 17 fatalities, or 8 per cent, on the previous year, when there were 210 fatalities. The number of fatalities is thus not on track (a maximum of 211 fatalities in 2022) to reach the necessary level by 2030.

The pandemic had an impact

The outcomes in 2022 were influenced – at least during the early part of the year – by the changed circumstances in society caused by the pandemic. The increase in the number of fatalities can be ascribed primarily to an increase in traffic as the pandemic abated. The total traffic volume increased by 2.8 per cent in 2022 compared with the year before, which itself saw an increase by 4.2 per cent on 2020. Even if traffic increased, it did not reach the level it had before the pandemic broke out. We also know that speeds declined during the pandemic, and that they continued to do so in 2022. Based on causal relationships observed earlier, lower unemployment and increased traffic have a negative effect on road safety.

Road user categories and accident types

The gap between fatalities in passenger cars and among vulnerable road users has grown smaller over time, but car occupants are still the dominant group. Single-vehicle accidents and head-on collisions with passenger cars are still the most common accident types. It can be noted in this context that the number of fatalities in head-on collisions increased from 2021 to 2022, after having been largely unchanged over the past decade. At the same time, fatalities in single-vehicle accidents declined. This means that single-vehicle accidents are no longer the most common type of accident. Every year there are relatively few fatalities of drivers of heavy goods vehicles, but in a collision involving a heavy goods vehicle, its considerable mass constitutes a great risk to other road users. In 2022 there were 53 fatalities in such accidents, which corresponds to 23 per cent of the total number of road traffic fatalities. Just over half of these occurred in passenger cars. The trend is for an increasing share of fatalities with a heavy goods vehicle involved.



Suicide

Suicides or other intentional acts are not counted has road traffic accidents, but are reported separately in official statistics if they occurred in road traffic and a moving vehicle was involved. The defined target for reducing suicides in the road transport sector also includes individuals jumping off bridges. In 2022 there were 36 suicides in road traffic; the definitive number of fatalities caused by individuals jumping off bridges has not been established. Here too we see a return to pre-pandemic levels.

New method for non-response compensation of seriously injured

The interim target also stipulates that the number of seriously injured in road traffic is to be reduced by 25 per cent by 2030. The Swedish Transport Agency has proposed a new method for compensating for non-response in surveys of seriously injured road users. A consultation on the proposal was carried out in the spring of 2023, and the proposal will be circulated for comment during 2023. As the method has not been officially adopted, no data on seriously injured road users has been produced, for 2022 or historically. If the new method is subsequently adopted for use, this also means that new interim targets for 2030 will need to be set. New retroactive calculations will then be needed in turn, as the interim target is based on an average value for 2017–2019. A new way of compensating for non-response may also affect which measures for increasing road safety need to be prioritised.

Median barriers

Adapting speed limits to the safety standard of roads, and continuing to install median barriers, are both crucial measures for attaining the 2030 interim targets. No speed limit adaptations based on road safety standard were carried out in 2021–2022, and 140 kilometres of road had median barriers installed. The new composition of indicators includes an additional indicator in the area Safe National Roads, for the installation of median barriers on some roads where speed limits have been lowered to 80 km/h. This is because lowering the speed limit to 80 km/h is insufficient, particularly in the event of a collision with a heavy goods vehicle. Greater consideration also needs to be paid to increased mobility. At the end of 2022, the share of the total traffic volume occurring on roads with median separation with speed limits between 80 and 120 km/h was 65.0 per cent; the target for 2030 is 70 per cent.

Speed adaptations set to continue

In 2022 the government commissioned the Swedish Transport Administration to examine how speed adaptation measures can be developed further. Speed adaptation measures need to be developed going forward, in order to achieve the highest possible road safety without excessively hampering mobility. This is above all the case when travelling distances are so long that a speed reduction leads to significant travel time increases. Roads and routes in this category need to be examined further before the Swedish Transport Administration can proceed with implementing measures. Shorter routes will have their speed limits adapted as planned, since the negative effect on travel times is very small when weighed against the resulting road safety benefit.

The Swedish Transport Administration will test and develop new, cost-effective measures to determine whether they can be used to complement speed adaptations with the ambition of achieving good mobility as well as good road safety. Examples include a new type of median barrier, new use of road markings, increased use of speed limits, etc. New combinations of existing road safety measures in order to maximise road safety are another possibility.

This new approach means that it is not possible at present to specify exactly how many kilometres of road will have adapted speed limits going forward.

Vehicle safety a positive factor

Vehicle safety is one of the main factors behind the positive road safety trend that we can see over time. Recently introduced and future vehicle systems such as autonomous emergency braking and lane keeping assistance systems will only have their greatest impact after 2030, however. As a rule of thumb, it takes up to 30 years from the introduction of a new safety system until it achieves the maximum benefit. For example, driver assistance systems such as seat belt reminders and electronic stability control have been standard equipment in Sweden since 2009. According to forecasts, the last fatal accident that can prevented with a seat belt reminder or electronic stability control will occur around 2030–2033. This means that the maximum benefit of these systems is expected to be achieved around 25–30 years after they were introduced. It is therefore important that all new cars sold have all the available safety equipment, which can be encouraged through legislation as well as through Euro NCAP, whose test protocols are continually updated.

Euro NCAP will begin testing the safety of heavy goods vehicles in 2024. Tests will initially cover autonomous emergency braking, lane keeping assist and other driver assistance systems. The effect on the roads of this may be expected to come faster than for passenger cars, as the heavy goods vehicle fleet in Sweden has a higher replacement rate than that for passenger cars. Earlier analyses show that two thirds of heavy goods vehicles involved in fatal accidents are less than 6 years old.

There is a growing trend for the introduction of driver monitoring cameras that can detect distraction and fatigue. They are believed to be capable of eventually reducing the number of serious accidents. Unfortunately, the number of unreported cases here is high, as it is very difficult to determine whether distraction or fatigue played a role in serious accidents, particularly in fatal accidents.

Alcohol and drugs-related traffic accidents

A quarter of all road traffic fatalities are the result of an alcohol or drugs-related accident, and increased measures need to be applied in order to reduce alcohol and drugs use in road traffic. There was a sharp reduction in the number of breath tests carried out during the pandemic, and in 2022 only just under 1 million were carried out. New vehicle systems as well as increased numbers of breath tests are among the necessary measures that have to be applied to reduce alcohol and drugs use in road traffic.

Cyclists and pedestrians

In 2022 there were 21 cyclist and 28 pedestrian fatalities in road traffic accidents. Around 65 per cent of these fatalities occurred in urban areas. The share of cyclist and pedestrian fatalities of all road traffic fatalities was 22 per cent, which is a proportion that has not changed much over time. There was a large share of vulnerable road users among those seriously injured. In urban areas, a new base speed limit of 40 km/h is a fundamental prerequisite for achieving a safe urban environment; in urban areas where vulnerable road users coexist with car traffic in a regular and planned way, a 30 km/h speed limit has to be secured. In 2022 the share of roads in urban areas with a 30–40 km/h speed limit was around 70 per cent. The target for 2030 is 99 per cent. The trend has shown steady improvement, even if a slight weakening of this trend can be seen since 2019. On bicycle helmets, previous years' studies show that almost half of very seriously injured cyclists sustained head injuries. A helmet can reduce a serious head injury by just over 50 per cent. Bicycle helmet use shows a positive trend, but there is still a long way to go to the necessary level of 80 per cent.

Interim targets and progress towards them

It is currently too early to assess whether it will be possible to attain the interim target for the number of fatalities by 2030, but we can note already that extensive measures will be required during the remaining period to do so. Many of the indicators show a positive trend, but are still not quite on track to reach the 2030 targets.

We have to bear in mind that there are many factors influencing the outcomes, and that interrelationships between these factors are complex. The management by objectives model, with indicators for a number of conditions with verified causal relationships, often linear ones, is a relatively rough simplification of reality. We measure and analyse these indicators individu-

ally, while also monitoring a number of external factors, in order to explain, as far as possible, the outcome in terms of the number of road traffic fatalities during a given year. There may also be external factors that influence the outcome, but which we are as yet unable to quantify. This, and random variation, can influence the outcome in unpredictable ways from one year to the next. Despite some statistical uncertainty and limitations to causal explanations, the management by objectives model with indicators remains an effective tool for guiding road safety work towards a road transport system adapted to human tolerance of blunt force.

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