

Young drivers in slow moving vehicles

The impact of A-tractors and moped cars on traffic safety

Susanne Wallhagen
Helena Selander

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Susanne Wallhagen

Helena Selander

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Authors: Susanne Wallhagen, VTI (orcid.org/0000-0002-5198-8851), Helena Selander, VTI (orcid.org/0000-0001-8026-5591).
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Abstract

Slow moving vehicles, A-tractors (also called “EPA”) and moped cars, have in recent years become increasingly popular among young people in Sweden. With their rising popularity, the number of crashes involving these vehicles has also increased.

The purpose has been to increase knowledge on crashes involving A-tractors and moped cars, as well as to describe how these vehicles impact traffic safety and the safety of other road users. The study involved crash data from the Swedish Traffic Accident Data Acquisition database (Strada) and interviews with police officers. The report is a shorter and translated version, based of the Swedish publication “VTI resultat 2023:8”.

A compilation of traffic crashes from 2016 to 2022, where the driver of the A-tractor or moped car was between 14 and 20 years old, showed that there were seven fatal crashes involving A-tractors, resulting in deaths of seven young people in the A-tractor and two unprotected road users. There were no fatal crashes involving drivers with moped cars in this age group. Furthermore, there were 37 serious crashes involving A-tractors, with 24 of them occurring in 2021–2022. In these crashes during the entire period, 32 young people in A-tractors and eight other road users, primarily pedestrians and moped or motorcycle users, were seriously injured. There were 12 serious crashes involving moped cars during this period, with ten young people in moped cars and three pedestrians being seriously injured. In the more severe A-tractor crashes, 91 percent of the drivers were male, while in the moped car crashes, 42 percent were male.

A total of 14 interviews were conducted with police officers throughout Sweden. It became clear that A-tractors and moped cars are a social phenomenon, where the "EPA culture" and group identity are important aspects. These vehicles are used for transportation in both rural and urban areas and for hanging out with friends. How these vehicles are driven affects traffic safety, for those in the vehicles and other road users, as well as the environment. The police reported various driving behaviours and crashes and had opinions on the defects and deliberate modifications on these vehicles. They pointed out legislation gaps, especially in cases of speeding, where the police are required to technically prove illegal vehicle modification/ tuning, which consumes considerable resources. The police were also critical of how vehicle inspections are performed and the lack of oversight of the involved parties.

In summary, there is a need for changes, both with compliance and to the actual regulations and legislation. Parents need to take greater responsibility, and the knowledge and skills of the drivers need to be improved to enhance the safety of the drivers themselves and other road users.

Keywords

A-tractor, EPA, moped car, moped, slow moving vehicles, traffic safety, young drivers, accident, crash, traffic police, EPA culture.

Kort sammanfattning

A-traktorer och mopedbilar har blivit allt populärare bland ungdomar under de senaste åren i Sverige. I takt med ökad popularitet har också personskadeolyckorna med dessa fordon ökat.

Projektets syfte har varit att öka kunskapen om olyckor med A-traktorer och mopedbilar, samt att beskriva hur dessa fordon påverkar trafiksäkerheten och tryggheten för andra trafikanter. Studien har innefattat sammanställning av olyckor (Strada) och intervjuer med poliser. Denna rapport är en engelsk översättning av den tidigare svenska rapporten "VTI resultat 2023:8".

Sammanställningen av trafikolyckor från 2016–2022 där föraren i A-traktorn eller mopedbilen varit 14–20 år visade att det skett sju dödsolyckor med inblandad A-traktor och där sju ungdomar i A-traktorn samt två oskyddade medtrafikanter dödats. Ingen dödsolycka med mopedbil skedde med förare i åldersgruppen. Det skedde dessutom 37 allvarliga olyckor med inblandad A-traktor varav 24 inträffade under 2021–2022. I olyckorna under hela tidsperioden blev 32 ungdomar allvarligt skadade i A-traktorn och åtta medtrafikanter, främst fotgängare, på moped eller motorcykel. Det skedde tolv allvarliga olyckor med mopedbil under tidsperioden, där tio ungdomar i mopedbil och tre fotgängare skadades allvarligt. I de allvarligare olyckorna med A-traktor var 91 procent av förarna män och i olyckorna med mopedbil var 42 procent män.

Totalt genomfördes 14 intervjuer med poliser runtom i Sverige. Det framkom tydligt att A-traktorer och mopedbilar är ett socialt fenomen där EPA-kultur och grupptillhörighet är viktiga aspekter. Fordonen används som ett transportmedel både på landsbygd och i städer, men också för att åka runt och umgås med vänner. Hur fordonen körs och används påverkar trafiksäkerheten, både för de i fordonet och för andra trafikanter, men påverkar även miljön/klimatet. Polisen rapporterar om olika felbeteenden och olyckor, samt har åsikter om fordonens brister och medvetna förändringar. De ser brister i lagstiftningen exempelvis vid hastighetsöverträdelser, där det ställs krav på polisen att tekniskt bevisa manipulationen vilket tar stora resurser i anspråk. Polisen är även kritisk till hur registrerings- och kontrollbesiktningar genomförs samt bristande kontroller av dess aktörer.

Sammantaget behöver regler och lagstiftning förändras och följas, föräldrar behöver ta ett ökat ansvar och förarnas kunskap och kompetens behöver höjas för att förbättra trafiksäkerheten för förarna själva och för andra trafikanters trafiksäkerhet och trygghet.

Keyword

A-traktor, EPA, mopedbil, moped, trafiksäkerhet, unga förare, trafikolycka, trafikpolis, EPA-kultur.

Summary

Slow moving vehicles, i.e., A-tractors and moped cars, have become increasingly popular in Sweden in recent years, and it is mainly young people aged 15-17 who drive and ride in these vehicles. As the popularity has increased, so have the number of personal injury accidents involving these vehicles. However, there is limited knowledge on the impact of young drivers in A-tractors and moped cars on road safety and on the crashes they are involved in, as well as which other road users are affected. Such knowledge is important to be able to take the right action. The purpose of the project has thus been to increase the knowledge on crashes with A-tractors and moped cars, where young people have been the drivers, and to describe how the vehicles affect road safety and the safety of other road users. The report is a shorter and translated version, based of the Swedish publication “VTI resultat 2023:8”.

A-tractors and moped cars may be driven from the age of 15 with the requirement of an AM-license. The driving education for the AM-license is designed for two-wheeled mopeds and, in addition to driving license theory, it only includes learning to drive a two-wheeled moped. It is not possible to practice driving a moped car or an A-tractor at a driving school and is illegal together with parents.

The A-tractor (also called EPA tractor) is a converted car registered as a tractor and should not be able to drive faster than 30 km/h. There may be one or two passenger seats next to the driver's seat, but the back seat is not allowed to be used and should not be accessible. From 31 August 2023, no more passengers are allowed than there are passenger seats, and everyone travelling in an A-tractor must wear a seat belt. A moped car is usually registered as a class I moped, with a maximum weight of 425 kg. The maximum allowed speed of a moped car is 45 km/h and seat belts are required unless a safety helmet is worn. Both A-tractors and moped cars must be equipped with an LGF plate at the rear indicating that they are slow-moving vehicles.

A compilation of traffic crashes in the Strada database (i.e., the Swedish Traffic Accident Data Acquisition) from 2016–2022, where the driver of the A tractor or the moped car had been 14–20 years old, showed that there had been seven fatal crashes involving an A-tractor and where seven young people in the A-tractor and two unprotected road users were killed. There were 37 serious crashes, of where 24 occurred between 2021 and 2022, which can be seen as a result of the increase in the number of A-tractors after 2020. In the crashes during the entire period (2016–2022), 32 young people were seriously injured in the A-tractor and eight other road users, mainly pedestrians and drivers of mopeds or motorcycles. There were no fatal crashes involving drivers of moped cars during the period, but there were twelve serious crashes involving moped cars, in which ten young people in moped cars and three pedestrians were seriously injured.

In the project, a comparison has been made between the number of vehicles and the number of serious crashes (and seriously injured). The results indicate that there have been relatively more serious crashes and there are more serious injuries in A-tractors than in moped cars, although the A-tractors are seen as safer.

In the more serious crashes involving A-tractors, including fatal crashes, 91 per cent of drivers were men and in the serious crashes involving moped cars, 42 per cent were men. Nine out of ten of the serious crashes involving A-tractors occurred during leisure time, and the rest occurred on the way to or from school. Among moped cars, seven out of ten occurred in leisure time and the rest on the way to or from school.

In all types of crashes (1,118 crashes involving A-tractors and 458 crashes involving moped cars), the following was found:

- A larger portion of A-tractor crashes, compared to moped cars crashes, occurred in the evenings and early nights, which was particularly evident on Fridays and Saturdays.

- Compared to moped car crashes, a slightly higher proportion of A-tractor crashes occurred in the dark.
- Crashes involving A-tractors were more common than crashes involving mopeds in rural areas and thus on roads with a speed limit of 70 km/h or higher.

In the project, 14 interviews were conducted with police officers around Sweden who described how they experience the driving behaviours among young people with A-tractors and mopeds, and how it affects road safety for the drivers themselves and for other road users. It became clear that A-tractors and mopeds are a social phenomenon in Sweden with a special group culture and where group affiliation is important. The vehicles are used as transport modes to school and leisure activities, both in rural and urban areas. How the vehicles are driven and used affects road safety, both for those in the vehicle and for other road users, but it also affects the environment/climate. In addition, the police report various misconduct that can cause accidents, especially among the young people who drive A-tractors. According to the police officers, when they had seen crashes with these vehicles, almost all A-tractors had been illegally modified or the drivers had skidded and "played" with the vehicles. The police also described that the vehicles (mainly A-tractors) often have defects that can affect road safety. In addition, it is common to make certain changes to the vehicle, such as vehicle tuning to be able to drive faster or removing the suspension and lowering the vehicle. Furthermore, the police feel that there are major shortcomings when registration and control inspections are carried out. The police would like to see changes in the legislation, especially regarding vehicle tuning which is common among drivers who drive A-tractors and requires large police resources. Illegal tuning can also be a difficult to prove in a legal context.

Based on the results, various **proposals for action** have been formulated:

- Education for AM license regarding driving a four-wheeled vehicle (i.e., A-tractor or moped car) needs to be changed and improved to increase the drivers' skills.
- Young people and parents need to be reached by targeted information initiatives and there should be higher demands on parents' responsibility.
- The legislative changes that were introduced in August 2023 regarding seat belt use and the number of passengers in A-tractors need to be followed up and evaluated.
- More breath tests for alcohol should be carried out when the police stop young drivers.
- Greater cooperation is needed between the Police, the Swedish Transport Agency and the inspection bodies when it comes to the vehicle registration and inspection of A-tractors.
- The police need increased resources and training to be able to effectively work with young drivers.

Preface

The number of moped cars and A-tractors has increased in recent years, and it is usually young drivers and young passengers in these vehicles. Accident statistics from the Swedish Transport Agency have also shown that accidents with personal injuries have increased significantly for these types of road users. However, knowledge on the accidents is limited and how these vehicles and the drivers affect road safety and the safety of other road users, including vulnerable road users. In light of this, the project which is mainly based on data from the Strada accident database and interviews with police officers was carried out with the support of the Swedish Transport Administration. This report is a shorter and translated version, based of the Swedish publication “VTI resultat 2023:8” (vti.se/publikationer).

Thank you to all of you police officers that we have been able to interview. You have all provided us with a lot of valuable information so that we have been able to carry out the project with such interesting results.

We would also like to extend a big thank you to Jörgen Persson at the Swedish Transport Administration and the project's advisory group, which, in addition to Jörgen, consisted of police officers Erling Andersson and Daniel Pettersson. We would also like to thank our colleague Christian Howard, who helped us with the translation of the report.

Linköping, February 2024

Susanne Wallhagen
Project Manager

Granskare/Examiner

Jonna Nyberg, Researcher VTI.

De slutsatser och rekommendationer som uttrycks är författarens/författarnas egna och speglar inte nödvändigtvis myndigheten VTI:s uppfattning./The conclusions and recommendations in the report are those of the authors and do not necessarily reflect the views of VTI as a government agency.

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1. Background

A-tractors and moped cars are two types of vehicles that have in recent years become increasingly popular among young people in Sweden. Both A-tractors and moped cars must be equipped with an LGF plate at the rear indicating to other traffic road users that they are slow-moving vehicles. A-tractors and “EPA tractors” are only available in Sweden [Swedish Transport Agency, 2022]. The EPA tractor is a converted car that could be registered until April 1, 1975 [Swedish Transport Agency, 2021b]. This type of vehicle is then registered as an A-tractor. In other words, the vehicle is a tractor, more specifically tractor a, with a design speed of no more than 40 km/h. However, the maximum permitted speed of the vehicle is 30 km/h. When the A-tractor has been rebuilt, it must be clear that it is no longer intended for the carriage of passengers or goods, but there may be one or two seats next to the driver’s seat. The rear seat is not allowed to be used and should not be accessible.

The vehicles are common all over the country and not only in rural areas to replace or supplement public transport [Selander, Wallhagen & Friis, 2023]. The number of A-tractors has increased significantly over the years and in 2022 the highest number of registered vehicles were in the municipalities of Sundsvall (1,157), Örnsköldsvik (652), Skellefteå (651), Umeå (640) and Norrtälje (621), see Figure 1. There is 5.0 A-tractors per 1,000 inhabitants in Sweden [Transport Analysis, 2023] and the highest number per 1,000 inhabitants is in Åsele (29.1), Vilhelmina (26.5), Dorotea (25.2) and Ånge (25.1).

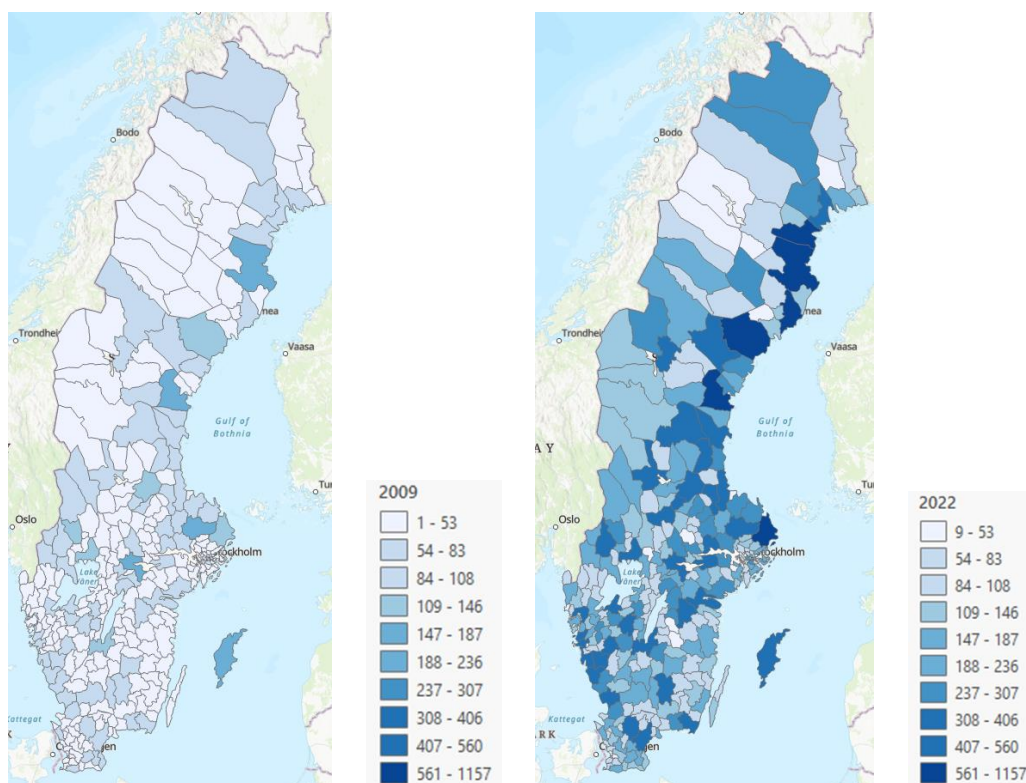


Figure 1. Number of A-tractors by municipality in year 2009 and year 2022. Source: Transport Analysis, 2023, graphic processing VTI.

A moped car should not weigh more than 425 kg and have a maximum speed of 45 km/h. A moped car may be driven on public roads, but not on motorways, nor on cycle paths. One (1) passenger is allowed, and seat belts must be worn. Moped cars have also become more popular and have increased for many years (Figure 2). In 2022, the highest numbers of moped cars were found in the municipalities of Nacka (582), Gävle (495), Stockholm (471) and Kungsbacka (464) [Transport Analysis, 2023]. There were 1.6 moped cars per 1,000 inhabitants in Sweden, with the highest number in Danderyd (6.6), Nykvarn (6.3), Kungsbacka (5.4) and Nacka (5.3).

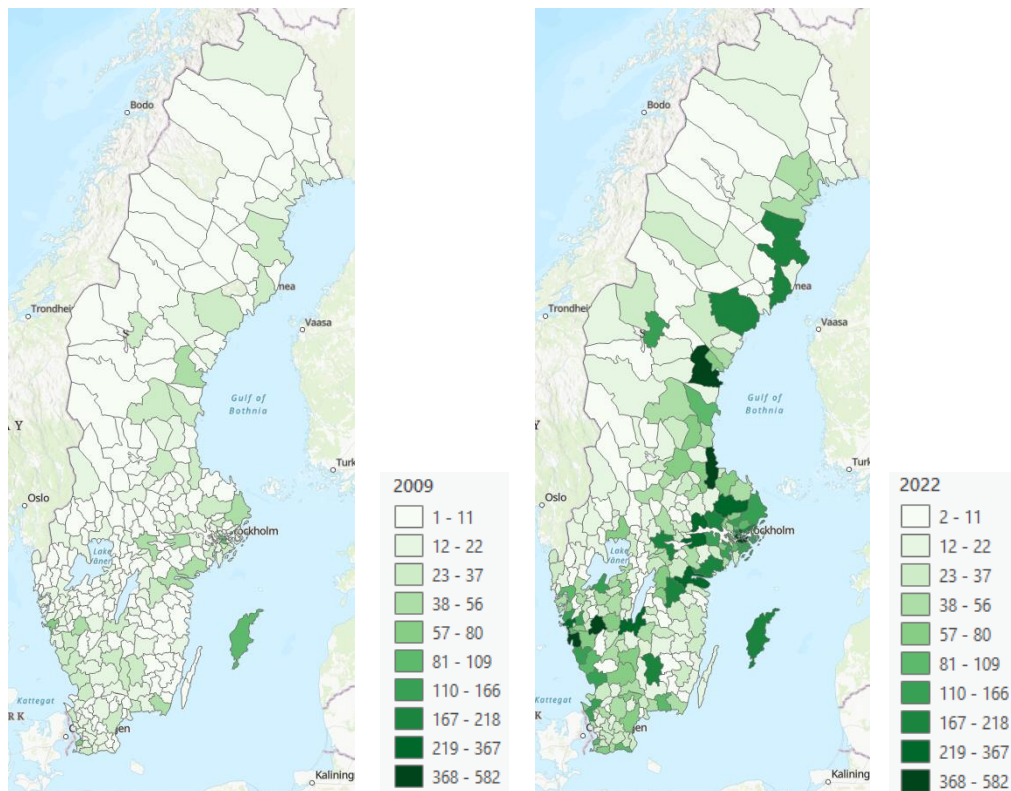


Figure 2. Number of moped cars by municipality in year 2009 and year 2022. Source: Transport Analysis, 2023, graphic processing VTI.

A survey conducted in 2022 showed that the young people who drove a moped car mostly used the vehicle to get to and from school, to drive together with friends, but also to get to leisure activities [Selander et al., 2023]. Since the young people drove themselves, the parents did not have to drive the young people to school, leisure activities or bus stops/train stations. According to the parents, the moped car was chosen mainly because it works in all weathers. Nearly half of the young people who reported driving a moped car used the vehicle several times a day, and another 35 per cent used a moped car 5–7 days a week. The most common journey lasted around 15–30 minutes (63%). Almost half of the young people in moped cars never drove on roads with a speed limit of 90 or 100 km/h. According to the survey, more than 90 per cent of young people travelled in a moped car on roads with a speed limit of 30–50 km/h several times a week. In addition, 60 per cent said they travelled on roads with a speed limit of 60–80 km/h several times a week. According to the young people and the parents, freedom and independence were the best things about the moped car [Selander et al., 2023; Vingren et al., 2021]. This meant that they could independently get to school, training, work and visiting friends. They did not have to depend on anyone else, and their parents did not have to give them a ride.

The responses from the previous survey showed that the young people who drove A-tractors used the vehicle to get to and from school about the same amount as they did to be able to drive around and be with friends [Selander et al., 2023]. The young people drove themselves to and from school, leisure activities or bus stops/train stations, mainly because there was no or insufficient public transport. According to the parents, the A-tractor was chosen mainly because it was perceived as safer than a moped car, but also because it worked in all kinds of weathers. In the same study, about 35 per cent of the young people who drove an A-tractor stated that they used it 5-7 days per week and the same proportion stated that they used it several times a day. Another 25 per cent used it a few days per week. The most common journey lasted about 15–30 minutes (56%). 20 per cent of the young people answered that the most common journey lasted about 40–60 minutes and 16 per cent answered that it lasted a maximum of 10 minutes. 30 per cent of young people in A-tractors never travelled on roads

with a speed limit of 90–100 km/h, although 15 per cent travelled on such roads several times a week. About 85 per cent of young people in A-tractors travelled on roads with a speed limit of 30–50 km/h several times a week and more than 70 per cent on roads with a speed limit of 60–80 km/h several times a week. According to young people and parents, the best thing about driving the A-tractor was freedom and independence [Selander et al., 2023; Vingren et al., 2021]. The freedom meant that they could go where they wanted and when they wanted and did not have to depend on getting a ride or using public transport. Many also had a long way to the bus stop. To have an A-tractor was also to be part of a community/culture where you made many friends.

A-tractors and moped cars may be driven from the age of 15 with a requirement for an AM license [Swedish Transport Agency, 2023a]. The driving education for the AM license is designed for two-wheeled mopeds and, in addition to driving license theory, only includes practice driving with two-wheeled mopeds. It is not possible to practice driving with a moped car or an A-tractor at a driving school and is illegal together with, for example, parents. In addition, there is no risk training during the driving education, thus, the young driver has very limited knowledge when they start driving the actual vehicle [Selander et al., 2023]. When the present study and previous projects [Selander et al., 2023] were carried out, there was no legal requirement for a seat belt to be used in an A-tractor. In a survey of young people who drove A-tractors, only 41 percent stated that they always wore a seat belt, while 78 percent of moped car drivers stated this [Selander et al., 2023]. The same study showed that only 25 per cent of passengers always wore seat belts in A-tractors and 73 per cent of passengers in moped cars. In the Swedish Transport Administration's publication on the safe use of moped cars and A-tractors [Swedish Transport Administration, 2020] it was found that almost all fatalities had been unbelted. For A-tractors, a legal requirement to wear a seat belt was introduced on 31 August 2023 [Swedish government, 2023]. In the past, there has also been no requirement for the maximum number of passengers in the vehicles, unless the number of passengers has been deemed to constitute a hazard when driving. Since August passengers must travel in a seat intended for passengers, and that only must be one passenger per such seat and that everyone who travels in the A-tractor must wear a seat belt. In the moped car, there is a seat belt requirement unless a safety helmet is used [Swedish Transport Agency, 2021a].

The technical requirements for converting a car to an A-tractor were simplified in 2020. Since then, the number of registered A-tractors has greatly increased (Figure 3) and there were almost 53 000 vehicles registered at the end of 2022. Moped cars have also become more common and were around 17,000 registered vehicles at the end of 2022 (Figure 4). As the popularity has increased, the number of crashes involving these vehicles has also increased, which is evident in the crash statistics. A compilation from the Swedish Transport Agency for the period 2016–2022 [Swedish Transport Agency, 2023b] showed that for A-tractors there has been a significant increase in the number of crashes (personal injuries) reported in Strada¹, from 109 crashes in 2016 to 348 crashes in 2022, see Figure 3. There was a peak in 2021 with 369 personal injuries/crashes. In the 348 crashes in 2022, approximately 45 per cent occurred in urban areas and 60 per cent on street/road sections. 35 per cent were collision crashes, 33 per cent were single-vehicle crashes and 14 per cent were rear-end collisions. In the 348 crashes in 2022, 4 people were killed and injured in the A-tractor. Of these 397, 78 per cent were in the 0–17 age group and 44 per cent were women.

¹ About the Strada accident database: <https://www.transportstyrelsen.se/sv/vagtrafik/statistik/Olycksstatistik/om-strada/>

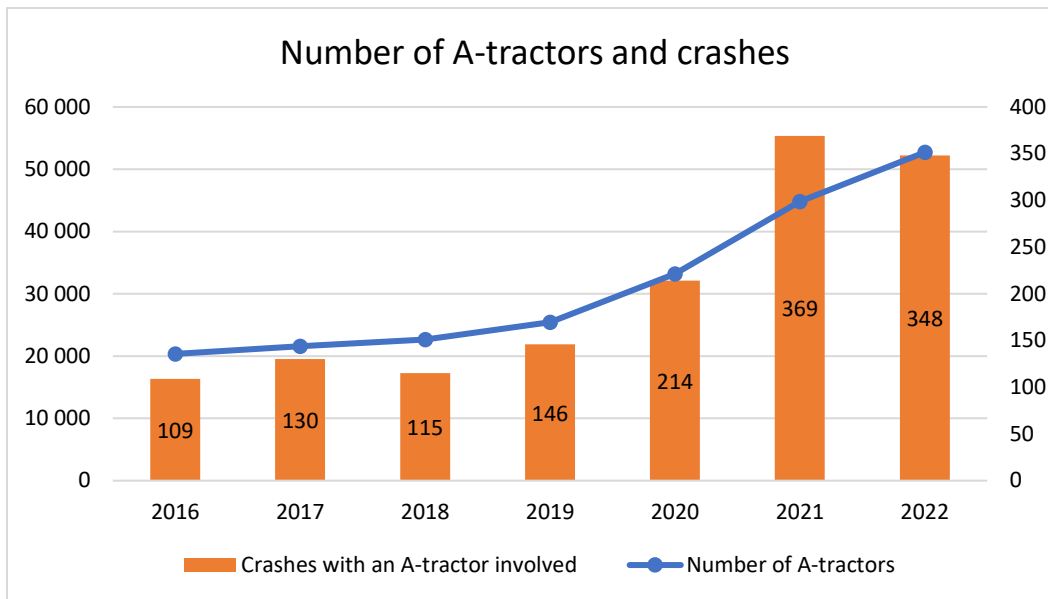


Figure 3. Number of registered A-tractors (line and left-hand y-axis) and number of crashes involving at least one A-tractor (bars and right y-axis). Sources: Transport Analysis, 2023 and Swedish Transport Agency, 2023b.

There has also been a substantial increase in the number of crashes and moped cars; from 55 personal injuries in 2016 to 130 crashes in 2022, see Figure 4. The number was highest in 2021 with 147 crashes [Swedish Transport Agency, 2023b]. Of the 130 crashes in 2022, about 60 per cent occurred in urban areas and half on street/road sections. 55 per cent were collision crashes, 35 per cent were single-vehicle crashes and 2 per cent were rear-end collisions. In the 130 crashes in 2022, no one was killed but a total of 125 persons were injured, 87 per cent of whom were in the age group 0 to 17 years. In 2022, 73 per cent of those injured in moped cars were women.

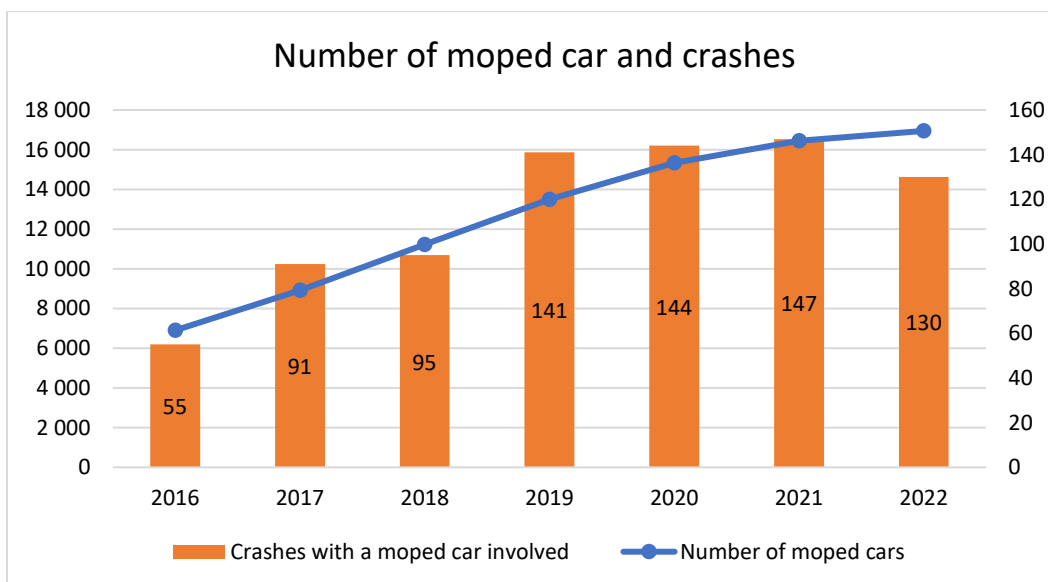


Figure 4. Number of registered moped cars (line and left y-axis) and number of crashes involving at least one moped car (bars and right-hand y-axis). Sources: Transport Analysis, 2023 and Swedish Transport Agency, 2023b.

Table 1 shows a list of crashes per 1 000 registered vehicles for A-tractors and moped cars. The number of crashes per registered vehicle involving a moped car is slightly higher than for A-tractors over the entire period. However, since 2020, when the number of A-tractors increased a lot, the difference between vehicle types has narrowed. For moped cars, crashes per vehicle have decreased

since 2019 and the lowest figure is for 2022. The number of crashes involving A-tractors per 1,000 vehicles was lower in 2022 than in the previous year.

Table 1. Number of crashes involving A-tractors and moped cars per 1,000 registered A-tractors and moped cars at the end of the year in 2016–2022. Sources: Transport Analysis, 2023 and Swedish Transport Agency, 2023b.

	2016	2017	2018	2019	2020	2021	2022
A-tractors	5,4	6,0	5,1	5,7	6,4	8,2	6,6
Moped cars	8,0	10,2	8,5	10,5	9,4	8,9	7,7

Some of the vehicles have been decommissioned, which is evident from the statistics on the number of registered vehicles in traffic at the end of the year. Registered vehicles *in traffic* at the end of the year are lower than the total number of registered vehicles at the end of the year, which also includes decommissioned vehicles [Transport Analysis, 2023]. In the past two years (2021–2022), a higher proportion of registered A-tractors have been *in traffic* at the end of the year, around 65 per cent compared to just over half in the previous period (2016–2019). More than 80 per cent of registered moped cars had been in traffic at the end of the year, which applies to the entire time period. If crashes and the number of registered vehicles in traffic are used for the year 2022, the number of A-tractors in a crash per 1,000 A-tractors will be 9.9, instead of 6.6 as shown in Table 1, and the corresponding number for moped cars is 9.6 per 1,000 moped cars, instead of 7.7.

It has also emerged that there are other issues beyond the crash statistics that need to be examined, for example the actual driving behaviour or how the vehicles in general affect accessibility and safety for other road users. Influence of peer pressure, group norms, and rule violations can cause dangerous or negative driving behaviours and can also affect the surrounding community [Selander et al., 2023]. There may be several factors and reasons for this, but if the trend of an increased number of vehicles continues, it is of great importance to understand in what way traffic safety for these vehicles and other road users may be affected.

2. Purpose

The aim of the project is to increase the knowledge on the crashes involving A-tractors and moped cars, mainly those who are injured in the crashes, and to describe how these vehicles impact traffic safety and the safety of other road users.

The following research questions were included:

- Who is involved in the crashes involving A-tractors and moped cars, and how seriously have they been injured?
- Do the crashes occur at certain times, in certain areas, traffic environments or on roads with a certain speed limit, and in what context did the trip occur, for example during leisure time or on the way to/from school?
- What behaviours or problems occur in terms of speed, possible tuning, number of passengers, seat belt use, influence of alcohol or drugs, mobile phone use, etc., both in traffic and in crashes?
- What is observed by the Police and what challenges, for example regarding road safety and security, do they describe based on their daily work?

3. Crashes involving young drivers registered in Strada

The purpose of the study was to analyse crashes involving A-tractors, moped cars and partly two-wheeled mopeds. The target group was young drivers, but a question was also raised about which other road users are involved in the crashes. In the study, young drivers include drivers who are 14–20 years old, as drivers sometimes drive these vehicles before the age of 15. Most AM drivers are between the age of 15 and 17, even up to 18 years [Selander et al., 2023], but after that it is likely that many have a category B driving licence and drive a passenger car. Hence, a maximum age for the driver of 20 years was chosen.

The fact that two-wheeled mopeds are partly included in this study is because this vehicle is used by a large part of the young people who have an AM license (moped class I) or a driver's license for moped class II, and therefore it is valuable with some comparative analyses.

The research question of what misbehaviours occur in terms of speed, possible tuning, number of passengers, seat belt use, influence of alcohol or drugs, and mobile phone use has been partly answered within the study of fatal crashes and serious crashes with A-tractors and moped cars (section 3.9) Otherwise, this can be found in the results of the interviews with police officers (Chapter 4).

3.1. Method

An extract from the police and emergency medical services' registration of road traffic crashes where at least one person was injured (these personal injury crashes are henceforth referred to as crashes) in the database Strada (Swedish Traffic Accident Data Acquisition) was made for the period 2016–2022. The inclusion criterion was persons aged 14 to 20 who had been involved in a personal injury crash when they were the driver of an A-tractor, moped car or two-wheeled moped. A file with 10,321 personal injury crashes was obtained for the road user categories Moped, Tractor and Other. Due to the fact that A-tractors and moped cars do not have their own road user category, a manual classification was initially needed based on the course of events of the crash. Of the crashes, 397 were not involving A-tractors, moped cars or two-wheeled mopeds. That left for analysis 9,924 personal injury crashes. Crashes involving at least one A-tractor accounted for 1,118 crashes, crashes involving at least one moped car 458 and personal injury crashes involving at least one two-wheeled moped accounted for 8,348 crashes.

In some crashes, there were several vehicles of the three types of road users, but these crashes have then been categorized as larger vehicles (A-tractor before moped car; moped car before moped). Despite reading all the sequences of events, it is possible that moped crashes may conceal moped cars if it is not explicitly stated in the sequence of events that there is a moped car involved in the crash.

The crashes have been analysed with respect to different variables, and with the greatest focus on A-tractors and moped cars. Possible passengers and other road users involved in fatal crashes and serious personal injury crashes involving A-tractors and moped cars were also examined.

It should be noted that the Strada information system provides nationwide coverage by the police and emergency care hospitals, but some cases may go unreported. For example, this includes less severe crashes where the police did not visit the scene or the persons involved did not seek emergency care. There is also a statistical loss from within the police and hospitals. A non-response handbook produced by the Swedish Transport Agency [Yamazaki, 2018] shows differences in reporting patterns. The Strada dataset used in the present study is from 2016 when the reporting of emergency hospitals became nationwide. The Swedish Transport Agency monitors the reporting rate, and says that "in general, the reporting rate of the police has gone down in recent years while the reporting rate of the healthcare system has gone up, but individual hospitals often have large variations in their reporting" [Brus, 2023]. During the pandemic years 2020–2021, hospitals' reporting was much lower, probably due to the increased burden on healthcare that the Corona pandemic constituted.

In the Strada dataset that has been analysed here, it has not been possible to account for any loss in the reporting rate. The analyses have been carried out using Microsoft Excel and IBM SPSS Statistics.

In Strada, it is police reports and/or medical reports that form the basis of the registered information. In the Strada socket, the proportion of reports from the police and health care varied between crashes involving A-tractors, involving moped cars and involving two-wheeled mopeds, see Table 2. In about three-quarters of the crashes involving A-tractors and moped cars, information was available from the police and from the medical services in good one-half of the crashes. In crashes involving two-wheeled mopeds, the situation was reversed. The police had reported in about four out of ten crashes and the medical services in seven out of ten crashes. In a lower proportion of the crashes involving all types of vehicles, there were reports from both the police and medical services.

Table 2. The number and proportion of registered crashes that have a police report or a medical report as the basis for the registration. The proportion is calculated from the total number of crashes in the vehicle category.

	A-tractor (1,118 crashes)		Moped car (458 crashes)		Two-wheeled moped (8,348 crashes)	
At least one police report	868	78 %	331	72 %	3 661	44 %
At least one medical report	622	56 %	248	54 %	6 129	73 %
Both Police and Medical Report	372	33 %	121	26 %	1 442	17 %

3.2. The crash trend of young drivers

Crashes involving at least one A-tractor increased significantly during the time period, especially after 2020, see Figure 5. From 2016 to 2022, the increase was 224 per cent. The corresponding increase in crashes involving moped cars was 188 per cent. From 2021 to 2022, there was a slight decline in crashes for both types of vehicles. The highest number of crashes involving A-tractors was in 2021 with 304 crashes. The number of crashes involving moped cars was highest, 91, in 2020. Crashes involving two-wheeled mopeds increased from 1,095 crashes in 2016 to 1,295 in 2022, an increase of 18 percent (not shown in figure). These crashes included both class I mopeds and class II mopeds. In the police's accident report, it is stated which moped class the traffic element involved was. During the entire time period, 84 per cent of the mopeds involved were class I, another 8 per cent were class II and for 8 per cent it was unknown which class the moped belonged to.

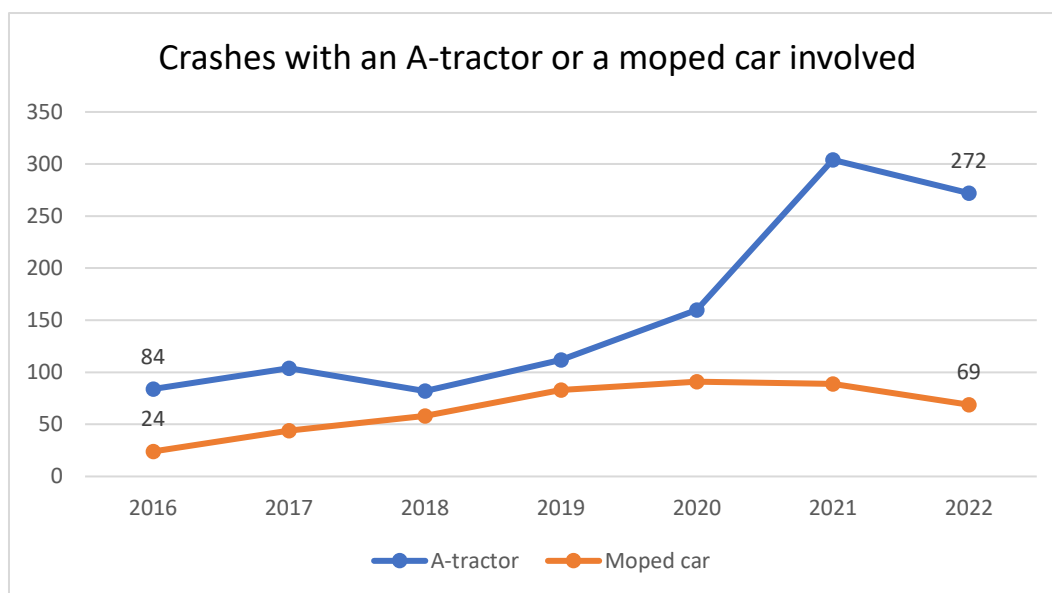


Figure 5. Number of personal injury crashes involving at least one A-tractor and at least one moped car in 2016–2022 where the driver was 14–20 years old. Total number of crashes: 1,118 A-tractors, 458 moped cars.

3.3. The young drivers' type of crash

It was desirable to see in Strada if the vehicles had been involved in a single vehicle or vehicle-vehicle crash. Unfortunately, this was difficult to implement because crash types (a specific Strada variable) for most A-tractor crashes were simply listed as *Tractor*. In moped and moped car crashes, it was immediately possible to see whether the crash type was a single collision or a vehicle-vehicle collision. The difference in categorization of crash type therefore makes it difficult to compare the three vehicle types. For fatal crashes and serious personal injury crashes involving A-tractors and moped cars, a manual categorization into crash type has been made based on the event description, this is reported in section 3.9.

In the case of moped cars and two-wheeled mopeds, the crash type was single-vehicle in 39 and 61 per cent of the crashes, respectively. Moped-motor vehicle crashes accounted for 35 per cent of the moped car crashes and 30 per cent of the two-wheeled moped crashes. In 9 per cent of the cases a moped car collided with another moped, and in 4 per cent of the cases a two-wheeled moped collided with another moped.

The police have stated how the crash ended, i.e. if the driver drove off the road or hit a solid object, such as a tree, pole, fence. Of Table 3 it appears that among the personal injury crashes recorded by the police, the A-tractor had driven off the road in 30 per cent of the crashes. The corresponding figure for moped cars was that 26 per cent and 9 per cent of two-wheeled mopeds had driven off the road. In 14 per cent of the crashes known to the police, there was information that the A-tractor had hit a fixed object. The corresponding share for moped cars was 11 per cent and for two-wheeled mopeds the corresponding share was 7 per cent. As evidenced by the Table 3 there were crashes where the vehicle both drove off the road and hit a fixed object.

Table 3. Police information on whether the driver drove off the road and/or hit a fixed object in personal injury crashes involving at least one A-tractor, moped cars or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Only crashes where there is a police report.

	A-tractor (868 crashes)		Moped cars (331 crashes)		Two-wheeled mopeds (3,661 crashes)	
	Number	Share	Number	Share	Number	Share
Driven off the road	264	30 %	85	26 %	337	9 %
Hit a solid object	122	14 %	38	11 %	243	7 %
Drove off the road AND hit a solid object (subset of options above)	74	9 %	19	6 %	37	1 %

3.4. Police suspect young drivers under the influence of alcohol

Alcohol influence can be a contributing factor to a crash. The police can state if the driver is suspected to be under the influence of alcohol, but Strada does not see if it is an alcohol breath test that is behind the suspicion. In a large proportion of the crashes, the suspicion was unknown, see Table 4. Among known cases, i.e. where the police filled in Yes or No, the proportion of suspected drivers of alcohol was 6.6 per cent among A-tractor drivers, 6.4 per cent among moped car drivers and 4.0 per cent among two-wheeled moped drivers.

Table 4. Suspected driver under the influence of alcohol in personal injury crashes registered by the police with at least one A-tractor, moped car and two-wheeled moped involved in 2016–2022 where the driver was 14–20 years old. Percentage (%) of suspects among known cases (yes and no).

	A-tractor (868 crashes)	Moped car (331 crashes)	Two-wheeled moped (3,661 crashes)
Yes (number)	44	15	99
No (number)	621	220	2367
Unknown/Not filled in (number)	199/4	92/4	1184/11
Percentage of YES among known cases (Yes and No)	6,6 %	6,4 %	4,0 %

3.5. Severity of crashes among young drivers

Strada contains a crash severity classification system where each person is classified on the hospital reported ISS scale as fatally, seriously (9+), moderately (4–8), or slightly (1–3). ISS is based on the Abbreviated Injury Scale (AIS) [Greenspan et al., 1985]. It is a six-point scale where 1 stands for a slight injury and 6 for a maximum, often fatal injury. In Strada healthcare, the maximum AIS (MAIS) and Injury Severity Score (ISS) are also calculated from the AIS values obtained. MAIS stands for the highest AIS value a person has and the ISS is the sum of the three highest AIS values squared in three out of six body regions. If only a police report exists, persons seriously and slightly injured according to police classification is translated to moderately and slightly injured, respectively. The person most severely injured then determines the overall crash severity.

During the seven-year period analysed, there were seven fatal crashes involving A-tractors involving the driver between 14 and 20 years of age (Table 5). There were no fatal crashes involving moped cars in the age group, but there were seven fatal crashes involving two-wheeled mopeds in the age group of young drivers. The proportion of minor crashes was highest where a moped car had been involved and lowest where a two-wheeled moped had been involved. This means that moderate and serious crashes (including fatal crashes) were more prevalent among crashes involving two-wheeled mopeds and subsequently in crashes involving A-tractors.

Table 5. Number of personal injury crashes of varying severity involving at least one A-tractor, moped car and two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Distribution (%) severity of the crash within the type of vehicle.

	A-tractor (1,118 crashes)		Moped car (458 crashes)		Two-wheeled moped (8,348 crashes)	
	Number	Share	Number	Share	Number	Share
Fatal	7	0,6 %	0	0,0 %	7	0,1 %
Severe crashes	37	3,3 %	12	2,6 %	177	2,1 %
Moderate crashes	142	12,7 %	40	8,7 %	1 704	20,4 %
Minor crashes	932	83,4 %	406	88,6 %	6 460	77,4 %

In Figure 6 shows the development of crashes involving A-tractors and moped cars in terms of severity. Fatal, serious, and moderate casualties are included in this figure. Minor crashes are shown separately in the Figure 7. The number of serious and moderate crashes involving A-tractors was many times higher in 2021 and 2022 than in previous years. The number of crashes involving moped cars was lower, although the number of moderate crashes was higher in 2019 and 2021.

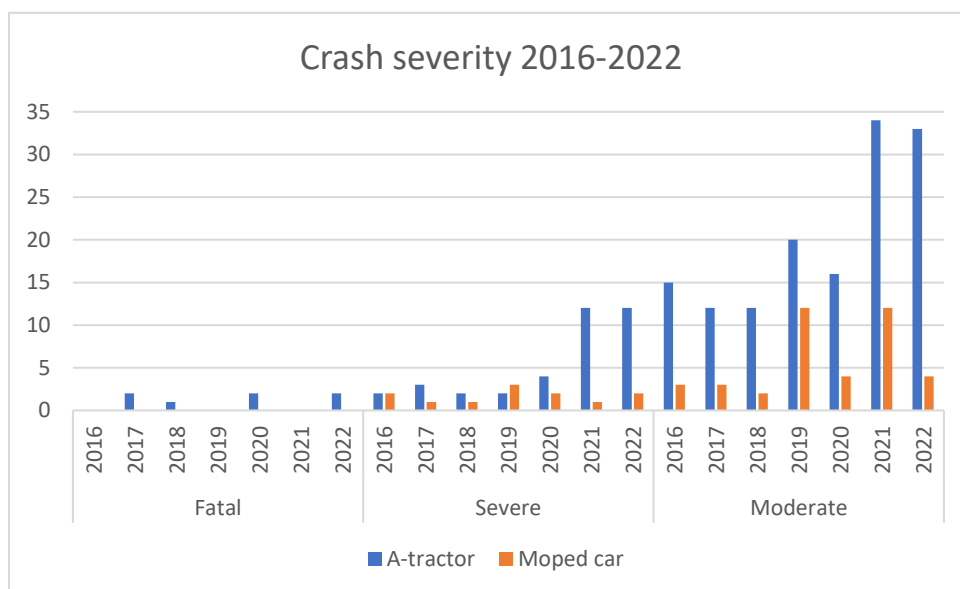


Figure 6. Number of fatal, severe and moderate crashes involving at least one A-tractor and moped car involving the driver aged 14-20. Annual report 2016–2022. Total number of crashes: 186 A-tractors, 52 moped cars.

The development of minor crashes involving A-tractors and moped cars during the period is shown in Figure 7. The number of minor crashes involving an A-tractor was also higher in 2021 and 2022 than in previous years, while the number of minor crashes involving moped cars has not varied much throughout the period.

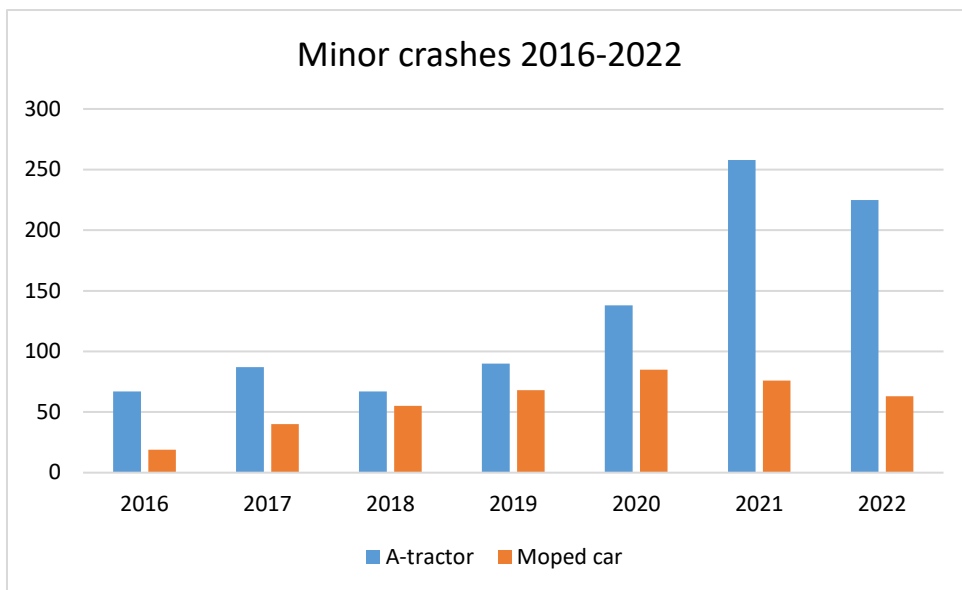


Figure 7. Number of minor crashes involving at least one A-tractor or moped car involving the driver aged 14–20 years. Annual report 2016–2022. Total number of minor crashes: A-tractor 932, moped car 406.

3.6. When did the crashes with young drivers occur?

Of the crashes of two-wheeled mopeds, 86 per cent occurred between April and October (Figure 8). Moped car crashes occurred to a lesser extent during the first five months of the year, just over 7 out of 10 moped car crashes occurred during June–December. More than six out of 10 A-tractor crashes occurred in the second half of the year, from July to December. The fact that the crashes for the three road user types do not have the same distribution over the months of the year is probably due to how they are used. The two-wheeled moped is probably mainly used when there is no risk of cold, snow and slippery roads, while young people who have four-wheeled vehicles with bodies can use them to a greater extent throughout the year.

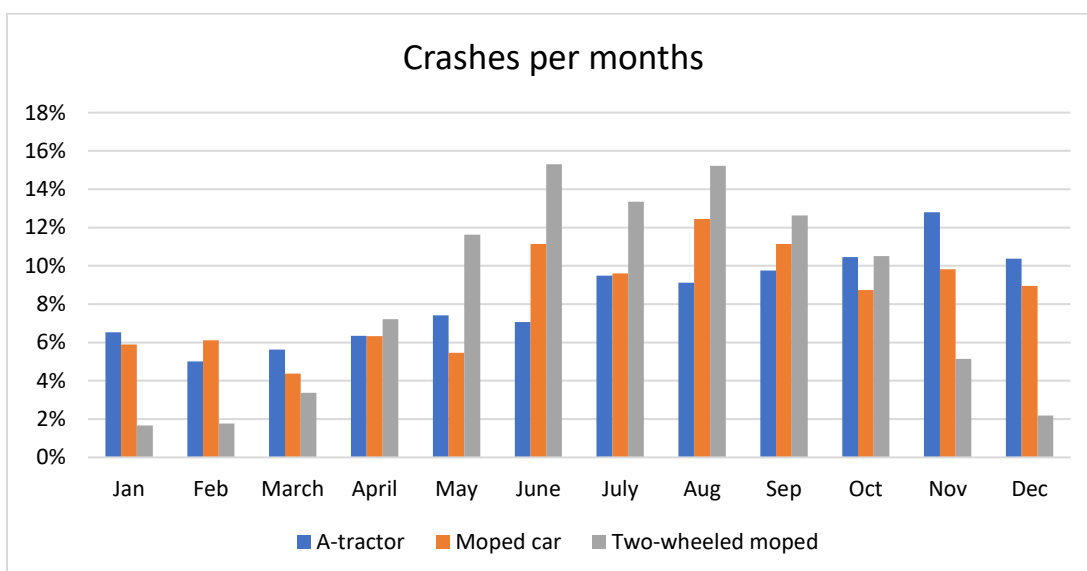


Figure 8. Breakdown of crashes by month within each vehicle type. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes: 1118 tractors A, 458 moped cars, 8348 two-wheeled mopeds.

Crashes involving A-tractors were more likely on Fridays and Saturdays, including on Sundays (Figure 9). Crashes involving moped cars and two-wheeled mopeds were also more common on Fridays.

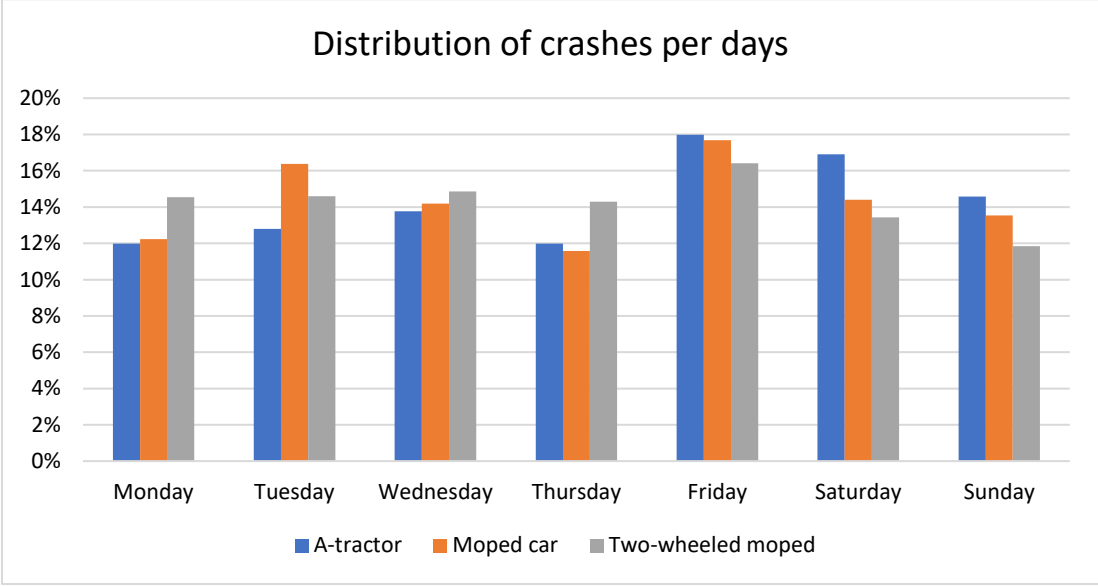


Figure 9. Distribution of personal injury crashes on weekdays within each type of vehicle. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes: 1118 tractors A, 458 moped cars, 8348 two-wheeled mopeds.

Two-wheeled moped crashes peaked in the afternoons, between 3 p.m. and 6 p.m., when more than a quarter of the crashes occurred (Figure 10), probably when the young people went home from school or to activities. Moped car crashes occurred in the afternoons and evenings and between 8 and 9 a.m. The number of A-tractor crashes in the afternoon was similar to that of moped cars, but the crashes were particularly evident from 8 p.m. until 1 a.m. This was particularly evident on Fridays and Saturdays, and suggests that the use does not primarily apply to travel to and from school.

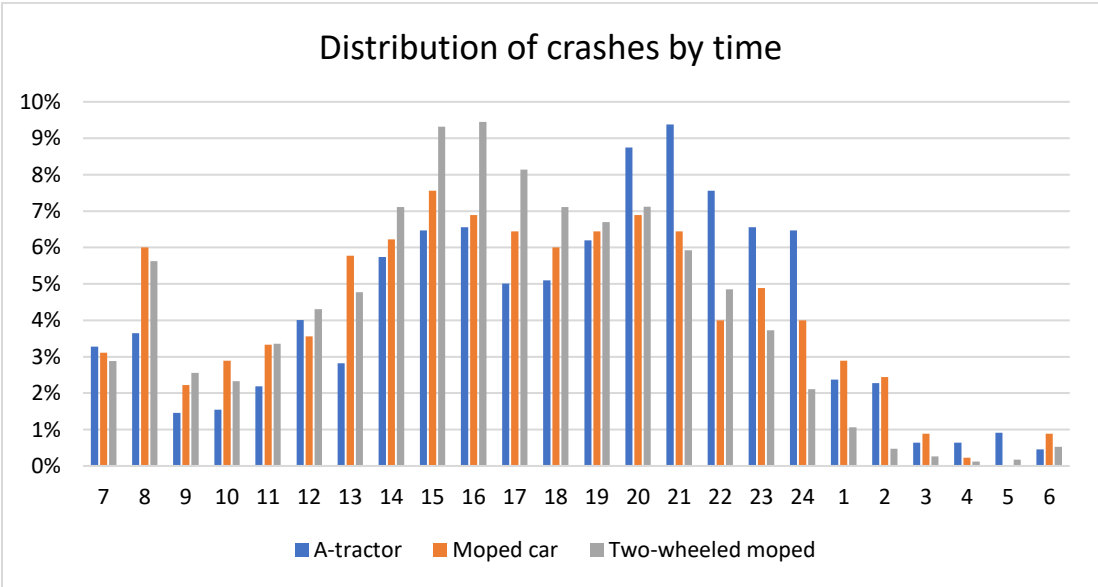


Figure 10. Distribution of personal injury crashes by time within each type of vehicle. 7 a.m. means 7:00 a.m. to 7:59 a.m., and so on. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes: 1098 tractors A, 450 moped cars, 8019 two-wheeled mopeds.

3.7. Where did the crashes with young drivers occur?

A quarter of the crashes involving moped cars occurred in Stockholm County, see Figure 11. There was also a slightly higher incidence of moped car crashes in Västernorrland and Västra Götaland counties compared to other counties. Crashes involving two-wheeled mopeds occurred mainly in the counties of Västra Götaland, Stockholm and Skåne. The distribution of A-tractor crashes by county shows their high prevalence in Västra Götaland County and Skåne County.

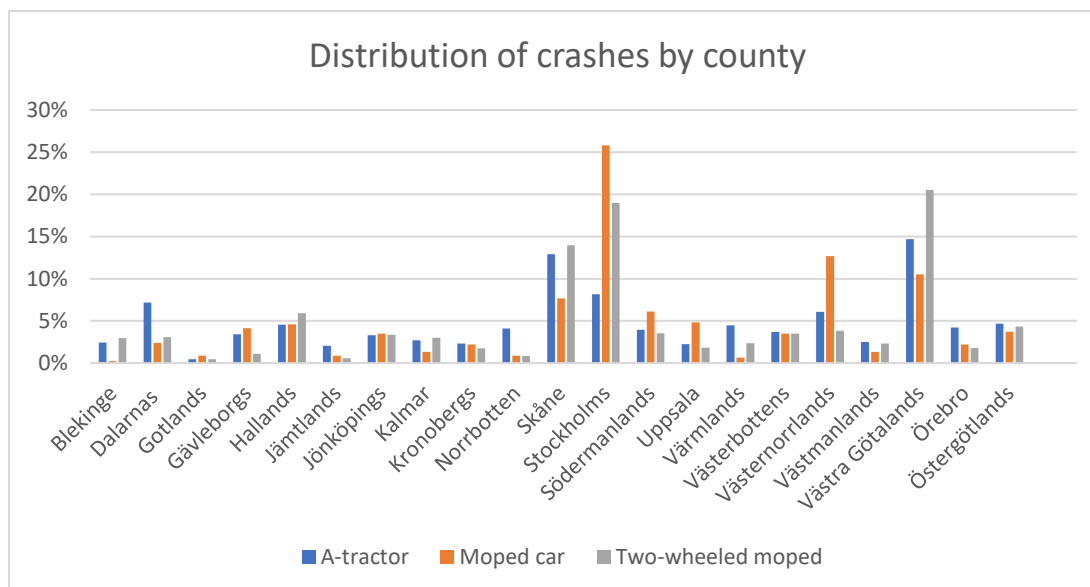


Figure 11. Distribution of crashes by county within each vehicle type. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes (not included): A-tractor 1117, moped car 457, two-wheeled moped 8326.

More than half of the A-tractor crashes occurred in rural areas (Figure 12). By contrast, more than half of moped car crashes and crashes with two-wheeled mopeds occurred in urban areas.

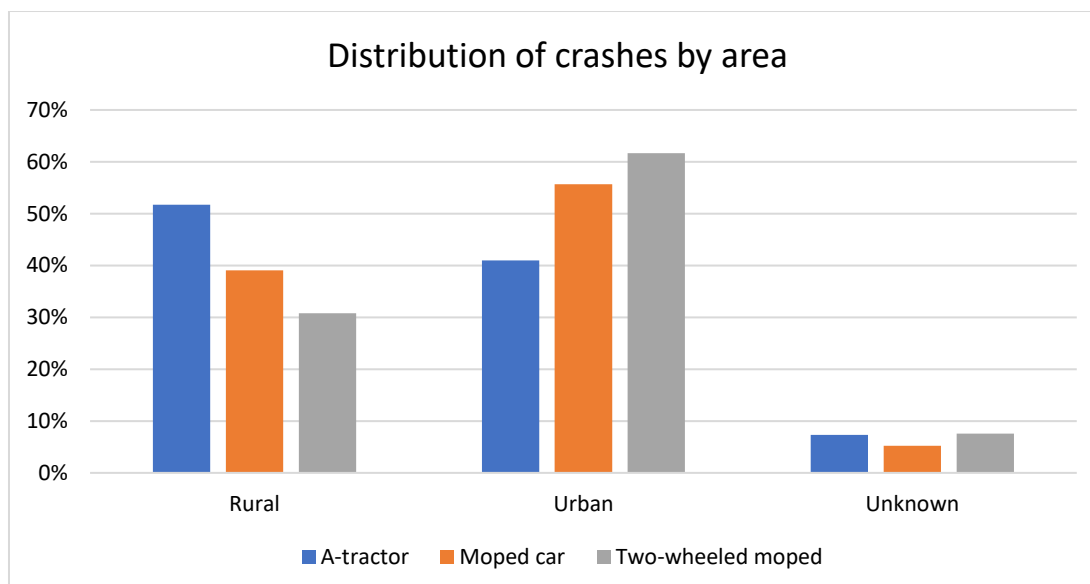


Figure 12. Distribution of crashes by type of area, i.e. rural and urban area within each type of vehicle. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes: 1118 tractors A, 458 moped cars, 8348 two-wheeled mopeds.

The largest share of personal injury crashes in the three vehicle types occurred on street/road sections, about two-thirds of A-tractor crashes and just over half of moped crashes (Figure 13). About a quarter of the crashes occurred at street or road intersections. Crashes involving two-wheeled mopeds also occurred in roundabouts and on pavements.

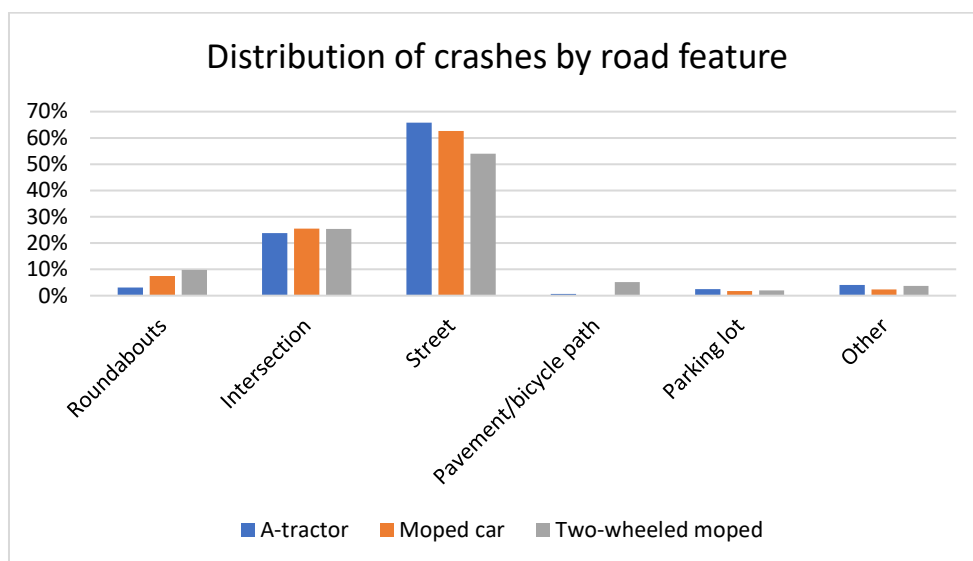


Figure 13. Distribution of crashes by vehicle type and road feature type. The Other category includes bus stop, square, interchange, other location and unknown. Crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Number of crashes: A-tractor 1118, moped car 458, two-wheeled moped 8348.

3.8. Road conditions in the case of crashes of young drivers

The speed limit of the road described here is documented by the police but contained many unknown or not specified. The proportion of unknown/unspecified speed limit among A-Tractor crashes accounted for 23 per cent, for moped cars 20 per cent and for two-wheeled moped crashes 28 per cent. In Figure 14 only crashes with a known speed limit are included. Crashes involving moped cars and two-wheeled mopeds occurred mainly on roads with a maximum speed limit of 60 km/h. This accounted for 75 per cent of moped car crashes and 85 per cent of two-wheeled moped crashes. Of A-tractor crashes, 54 per cent occurred on roads with a maximum speed limit of 60 km/h. A quarter of crashes involving A-Tractors occurred on roads with a speed limit of 70 km/h and just over 20 percent on roads with a higher speed limit.

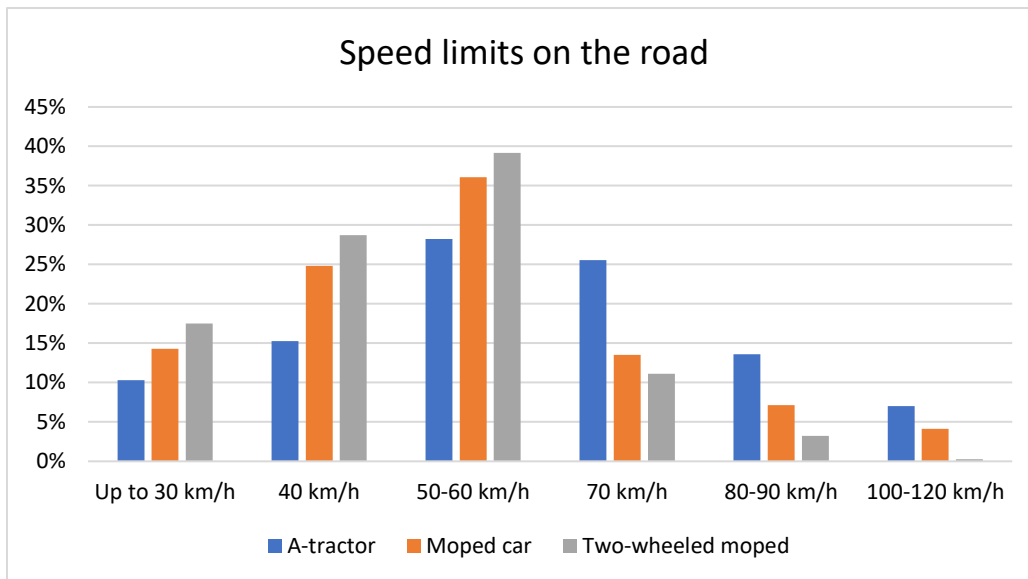


Figure 14. Police data on speed limits where the crashes occurred, involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022, and where the driver was 14–20 years old. Distribution by speed limit within each type of vehicle. Number of reports with known speed limit: A-tractor 669, moped car 266, two-wheeled moped 2634.

The road maintenance condition was not filled in or filled in as “Unknown” in about 30 per cent of the crashes involving A-tractors and moped cars and about 60 per cent of the crashes involving two-wheeled mopeds, which is mainly due to the fact that the police were not on site and were unable to fill in the information. In Figure 15 crashes are shown where the road conditions are known. In the majority of the crashes, the road surface was dry, but it differed slightly between the different types of vehicles. Dry roads occurred in nearly 70 per cent of crashes involving two-wheeled mopeds and around 60 per cent of crashes involving A-tractors and moped cars. The road surface was wet or damp in one-quarter of four-wheeled vehicle crashes and one-fifth of two-wheeled moped crashes. In 17 per cent of A-tractor crashes and 11 per cent of moped cars crashes, there was ice or snow in the road surfaces, but only two per cent of crashes involving two-wheeled mopeds. This of course has to do with the fact that two-wheeled mopeds are not driven so much in winter when there is a risk of ice and snow, compare with Figure 8.

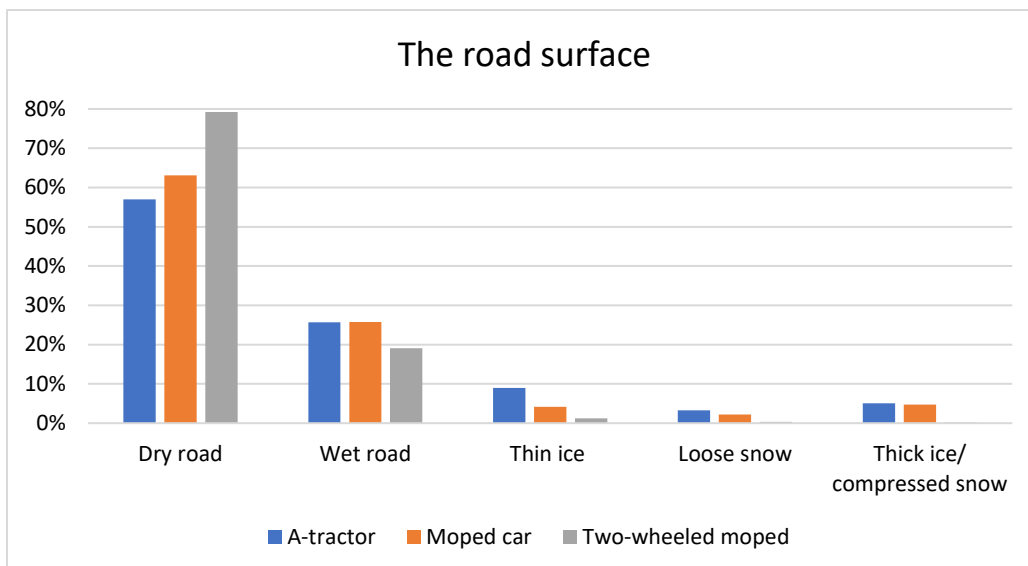


Figure 15. Police data on road conditions in crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Distribution by road conditions within each type of vehicle. Number of reports with known road conditions: A-tractor 790, moped car 314, two-wheeled moped 3278.

The weather was not filled in or filled in as Unknown in about 30 per cent of the crashes involving A-tractors and moped cars and about 60 per cent of the crashes involving two-wheeled mopeds. In Figure 16 crashes where the weather is known. In 90 per cent of the crashes involving two-wheeled mopeds, the weather was calm and 8 per cent rainy. Crashes involving A-tractors and moped cars also had the most rainfall or snowfall than in two-wheeled vehicle crashes.

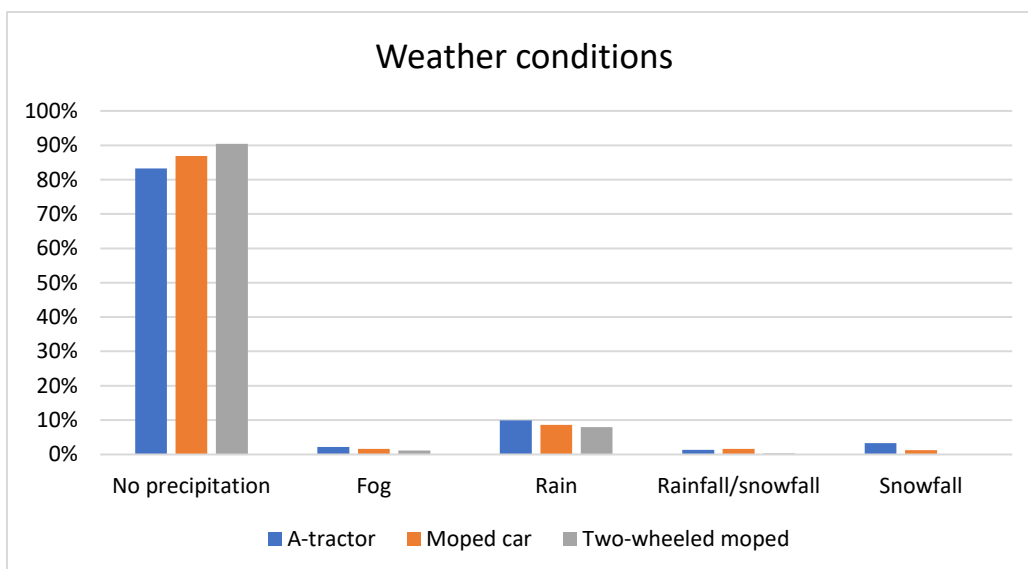


Figure 16. Police data on weather conditions in crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Distribution by weather within each type of vehicle. Number of reports with known weather: A-tractor 794, moped car 313, two-wheeled moped 3283.

The light condition was not filled in or filled in as “Unknown” in 25 per cent of A-tractor crashes, 30 per cent of moped car crashes and about 60 per cent of two-wheeled moped crashes. Figure 17 indicates crashes with known light conditions. It is clear that a higher proportion of A-tractor crashes occurred in the dark than crashes involving two-wheeled mopeds, just under 50 per cent compared to 20 per cent. This is, of course, a consequence of the fact that crashes among A-tractors to a greater

extent have occurred during the autumn/winter and in the evenings. A fairly large proportion of moped car crashes, just under 40 per cent, also took place in the dark.

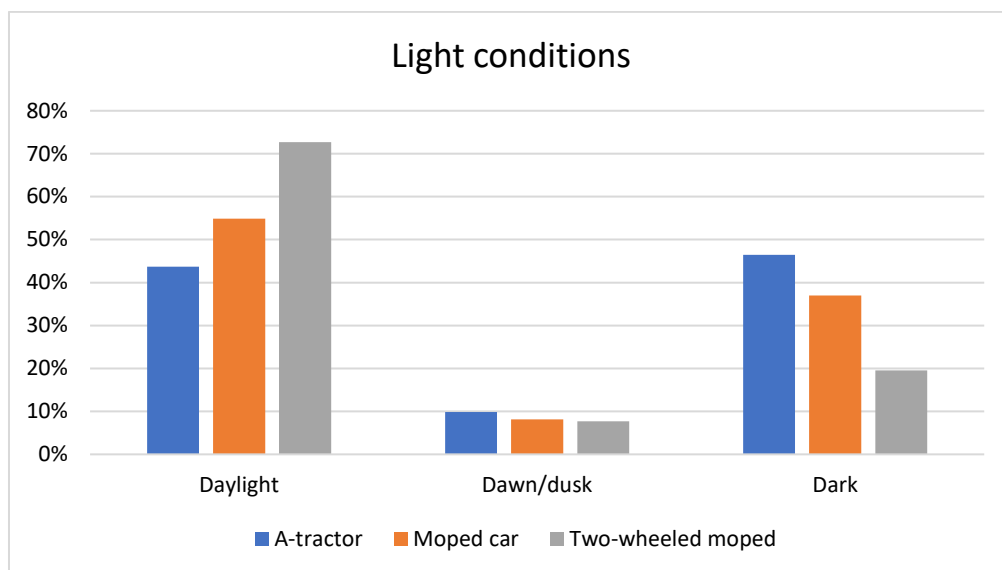


Figure 17. Police data on light conditions in crashes involving at least one A-tractor, moped car or two-wheeled moped in 2016–2022 where the driver was 14–20 years old. Distribution by light condition within each type of vehicle. Number of reports with known light conditions: A-tractor 844, moped car 319, two-wheeled moped 3458.

3.9. In-depth description of fatal and serious crashes

We have taken a closer look at the seven fatal crashes involving A-tractors and give a detailed look at the 3.9.1 in-depth information. In these crashes, there are medical reports from the 21 people involved.

There were 37 serious crashes involving A-tractors and in these crashes, there are medical reports of 94 people involved. Section 3.9.2 is provided with more details. There were 11 crashes involving moped cars, possibly 12 crashes, see section 3.9.3. In a single-vehicle crash from 2016, there is only one medical report and it says "Lost control of the car when pat. came out into the gravel after looking in the rear-view mirror." At the same time, it says "Yes" in the variable 'Helmet' and the variable 'Other protective equipment', and that the variable 'Belt' is not filled in. Despite this, we choose to include the crash as a moped car crash, because the categorization of all crashes is based on the course of events of the crash, which in this case says that it is a moped car.

3.9.1. Fatal crashes involving A-tractors

During the seven years analysed, 2016–2022, there were a total of seven fatal crashes involving A-tractors and where the driver was 14-20 years old. Four of these crashes occurred in 2020 and 2022.

Table 6 gives more information on how the people were injured in the crashes. A total of nine people were killed, two of whom were not drivers or passengers in A-tractor (one motorcycle rider, one pedestrian). All involved drivers and passengers in the A-tractor were aged 14-17 years. The drivers were between 15 and 17 years old. In the crashes, the police had no suspicion that the A-tractor driver was under the influence of alcohol.

The hospitals could fill in if the crash occurred during leisure time or on the way to/from work/school. In three of the crashes, it was stated that the crash occurred during the leisure time of the occupants of the A-tractor. There were only a few reports of whether a seat belt had been used or not. The driver of an A-tractor was often a man, in six of the seven crashes.

Four of the crashes were single-vehicle crashes, in which the driver and/or passengers of the A-tractor were killed and the frontal collision occurred with a heavy truck. The motorcycle driver was killed in a collision with a heavy motorcycle, but no one in the A-tractor. In another crash involving another road user, a pedestrian who was backed up was killed, but not anyone in the A-tractor. In three of the single-vehicle crashes, the A-tractor drove off the road and two of these crashes ended in a collision with a tree. In a single-vehicle crash, passengers were travelling on the platform and were thrown off. Two of the crashes were reported to have occurred in built-up areas with speed limits of 30 and 40 km/h. In one crash, the type of settlement was unknown, but the speed limit was stated as 40 km/h. In the four crashes outside built-up areas, the speed limit was set at between 60 and 70 km/h.

In six of the seven crashes, the road surface was dry and the weather was calm. In the reversing crash, the road surface was wet/damp, it was raining and dark. In other fatal crashes, it was also dark, except for two single-vehicle crashes with daylight.

Table 6. Analysis of 21 road users involved in seven fatal crashes involving A-tractors and where the A-tractor driver was between 14 and 20 years old. D=driver, P=passenger, Mc=motorcycle, Ht=heavy truck.

Type of crash	Death		Seriously injured	Moderately injured	Slightly injured	Undamaged/Uncertain Damage	
	A-tractor	Other road user				A-tractor	A-tractor
Single	P				P	D + P	
Single	D			P + P			
Single (tree)	D				P		
Single (tree)	D + P		P	P			
Reversing		Pedestrian				D	
Meeting		Mc-D			D		
Meeting	D + P		P				Ht-D
COMPLETELY	7	2	2	3	3	3	1

3.9.2. Serious crashes involving A-tractors

Table 7 describes the 94 road users involved in the 37 crashes classified as serious, which means that the most seriously injured person was injured with ISS 9-, see more in section 3.5. In 29 of the 37 crashes, the driver (15 persons) and/or passengers (17 persons) of the A-tractor were seriously injured. In eight of the crashes, the other part was seriously injured. There were two pedestrians, two on mopeds, two on motorcycles, one on tractors and one in a passenger car. Crashes also involve moderately injured, slightly injured and uninjured persons, or persons with uncertain injuries, both in the A-tractor and among the counterparties. The number of serious crashes has increased sharply since 2020; in 2021 and 2022, 24 of the 37 crashes occurred during the seven-year period, 65 percent.

The drivers of the A-tractors were between 14 and 18 years old. There were two who were 14 years old, 14 drivers who were 15 years old, 12 who were 16 years old and eight who were 17 years old and one who was 18 years old. Only three of the 37 A-tractor drivers were women (8%). These three crashes occurred in 2021 or 2022.

In three of the 37 crashes, suspected alcohol influence was registered for the driver of the A-tractor, of which in two cases there was alcohol according to the health care's test results. No suspicion was registered in 31 crashes, so the proportion of (suspected) alcohol influence among known cases (34) was nine per cent. In some cases, the medical services have registered whether the driver stated that they were wearing a seat belt. "Yes" was recorded in five crashes and "No" in twelve crashes. In one crash it was stated that the A-tractor had no belts and in the remaining 19 crashes the variable was not filled in. The health care system can also indicate whether the crash occurred during leisure time or on the way to/from school/work. In seven crashes, no record was made concerning the A-tractor. Of the

other crashes, 27 occurred during leisure time and three on the way to or from school. Thus, 90 per cent of crashes involving A-tractors occurred during leisure time.

The classification of the type of crash is based on the description in the variable *Sequence of events*. Of the 37 crashes, 25 were classified as single-vehicle crashes (68 per cent). In four of these crashes, young people were sitting on the platform of the A-tractor, fell off when turning and were seriously injured. In these cases, the driver was uninjured. In another crash, the passenger was seriously injured while sitting on the lap of another passenger and the airbag deployed. The driver and other passenger were slightly injured.

There were two crashes involving pedestrians who were seriously injured, but the occupants of the A-tractors were not seriously or moderately injured. In one of the pedestrian crashes, the collision took place on a pedestrian crossing, and in the other crash, the pedestrian had been the driver of another A-tractor but got out of his vehicle and was hit. Two crashes can be classified as rear-end collisions in which the other vehicle, in these cases trucks, hit the rear end of the A-tractor.

Two crashes were head-on collisions. In one, the A-tractor crossed into the oncoming lane and collided with the oncoming moped when the driver tried to return to the correct lane while the moped driver swerved. In the second, the A-driver crossed into the oncoming lane and collided with a bus.

Five crashes can be classified as crossing where a collision with a passenger car occurred when the A-tractor turned left and a collision with a heavy truck occurred when the A-tractor did not observe the obligation to stop and crossed the main road. In three of the collision crashes, the unprotected counterparts on motorcycles and mopeds were seriously injured. The moped driver did not observe the obligation to give way at a junction. The two collisions with a motorcycle occurred when the driver of the A-tractor was about to make a left turn and a right turn at a junction and the motorcyclists coming from the same direction did not notice this. One crash was a towing crash in which the A-tractor towed a tractor (body code 01) with a trailer that had ended up in a ditch and had been stopped by a culvert.

Table 7. Analysis of 94 road users involved in 37 serious crashes involving A-tractors and where the A-tractor driver was between 14 and 20 years old. D=driver, P=passenger, Lt=light truck, Ht=heavy truck, Pc=passenger car, Mc=motorcycle.

Type of crash	Seriously injured		Moderately injured		Slightly injured		Undamaged/Uncertain Damage	
	A-tractor	Other road user	A-tractor	Other road user	A-tractor	Other road user	A-tractor	Other road user
Single	P				D			
Single	D							
Single	P		P		D			
Single	D				P+P			
Single	P		P				D	
Single	P				D+P			
Single	D				P+P			
Single	P+P		P		D			
Single	D							
Single	P						D+P	
Single	P						D	
Single	P		P+P		D			
Single	D				P			
Single	D				P			
Single	D							
Single	D		P+P					
Single	P				D			
Single	D							
Single	D				P+P			
Single	P				P		D	

Type of crash	Seriously injured		Moderately injured		Slightly injured		Undamaged/Uncertain Damage	
	A-tractor	Other road user	A-tractor	Other road user	A-tractor	Other road user	A-tractor	Other road user
Single (flatbed)	P				P		D	
Single (flatbed)	P		P				D	
Single (flatbed)	P+P				P		D	
Single (flatbed)	P		P				D	
Pedestrian		Pedestrian			D			
Pedestrian		Pedestrian					D	
Overtaking	D		P			Ht-D		
Overtaking	D					Lt-D		
Meeting		Moped-P				Moped-D	D+P+P	
Meeting	D							Bus-D
Intersecting		Pc-P		Pc-D			D	
Intersecting		Mc-D					D	
Intersecting	D+P				P			Ht-D
Intersecting		Mc-D					P	
Intersecting		Moped-D					D	
Towing		Tractor-D					D	
COMPLETELY	32	8	10	1	20	3	18	2

Nearly seven out of ten personal injury crashes involving A-tractors occurred in rural areas (24). There were eleven crashes that were reported to have occurred in urban areas and in two crashes the type of settlement was unknown. In 30 of the crashes, the speed limit on the road was indicated. In 13 of the crashes, the speed limit was 40–50 km/h and in 16 of the crashes, the speed limit was 70–80 km/h. In one crash, the speed limit was 100 km/h, and in the crash, the A-tractor was hit from behind by a heavy truck. This crash took place in the dark with sleet and thin ice on the road.

Light conditions were known in 29 crashes, 11 of which were daylight, two were dawn/dusk and 16 (55%) of the crashes were dark. Weather was calm in 25 of the 30 crashes where weather conditions were indicated, i.e. in 83 per cent of the crashes. In the remaining crashes, there was rain (3 crashes), sleet or snowfall. Road conditions were dry in 21 out of 32 crashes. In eight crashes, the road surface was wet or damp, and in three crashes, there was ice or snow.

3.9.3. Serious crashes involving moped cars

During the time period, there were twelve serious crashes involving moped cars, although there is some doubt as to whether the first crash in Table 8 was with a moped car or two-wheeled moped, see section 3.9. There are between one and three crashes annually. From Table 8 it appears that there are reports from the health care system regarding 25 road users involved in these crashes. Ten of the seriously injured road users were travelling in a moped car, six as a driver and four as a passenger, in nine of the crashes. In three crashes, pedestrians have been seriously injured, and the driver of the moped car has been uninjured or with uncertain injuries. The driver of a moped car was also uninjured in a single-vehicle crash, while the passenger was seriously injured. In this crash, the driver swerved to avoid a deer, aquaplaned, drove off the road and collided with a tree. There were four more single-vehicle crashes. In two of these, the driver also crashed into trees after distracting with a mobile phone and falling asleep, respectively. In one of the two rear-end collisions, the driver of a moped car crashed into a braking car in front, while in the other, the moped car was hit from behind by a heavy truck with a trailer. In a head-on collision, the moped car was first hit by a heavy truck, which made a lane change, so that it flew over the barrier and fence to end up in the oncoming lane where it was hit by a car. In an intersecting crash, the driver of a moped car made a left turn and collided with a passenger car coming from the front.

The moped car drivers were 15 years old (4 persons), 16 years old (5 persons) or 17 years old (2 persons) and one who was 20 years old. Seven of the drivers were women (58%) and five were men (42%). In all five crashes that took place in 2020–2022, the driver of a moped car was a woman, as in two of the three crashes in 2019.

There was no suspicion of being under the influence of alcohol in these serious moped car crashes. The variable was filled in with “No” in eight of the crashes and in the remaining crashes “Unknown” was filled in or the variable was not filled in. Seat belt use was also not fully completed by the health care system: there was a “Yes” in three of the crashes and a “No” in two. Helmet was filled in in one crash. Five of the crashes occurred during leisure time and two on the way to/from school. In the remaining five crashes, the variable was not filled in or it said “Unknown”.

Table 8. Analysis of 25 road users involved in 12 serious crashes involving moped cars and where the moped car driver was between 14 and 20 years old. D=driver, P=passenger, Ht=heavy truck, Pc=passenger car.

Type of crash	Seriously injured		Moderately injured		Slightly injured		Undamaged/Uncertain Damage	
	Moped car	Other road user	Moped car	Other road user	Moped car	Other road user	Moped car	Other road user
Single	D							
Single	P				D			
Single	D							
Single	P				D			
Single	P						D	
Pedestrian		Pedestrian					D	
Pedestrian		Pedestrian					D	
Pedestrian		Pedestrian					D	
Overtaking	D							
Overtaking	D				P			Ht-D
Meeting	D							Ht-D + Pc-D
Intersecting	D+P		P	Pc-D				
COMPLETELY	10	3	1	1	3	0	4	3

Seven of the crashes occurred in urban areas and five in rural areas. In six of the crashes, the speed limit on the road was 30–50 km/h, in three crashes it was 60–70 km/h and in three crashes it was 90–100 km/h.

Light conditions and weather conditions were indicated for nine crashes. Of these, four took place in daylight, two at dawn/dusk and three in the dark. There were six crashes and three rains. The road surface was dry in four crashes, wave/damp in four and there was ice or snow in two crashes.

4. Interviews with police officers

Another aim of the project was to gain knowledge and understanding of how the police perceive young people's driving behaviour and how it affects road safety for the drivers themselves and for other road users' safety and security.

4.1. Method and procedure

With the help of the advisory group in the project (see Preface) and other contacts within the Police Authority, 14 police officers who work with motorized youths were recruited. The police officers had different positions such as traffic police, municipal police or car inspector and some of the traffic police were trained in *flying inspection*, which means that they have the right to inspect vehicles on the road. They worked in different areas of Sweden, in both smaller towns and larger cities, all with surrounding rural areas.

An interview guide was created with questions about the police's experiences of young people driving A-tractors and moped cars; what behaviours occur; the need for changes and accidents with the vehicles. The purpose of the questions was to answer the research question of what driving behaviours are observed by the Police and what challenges, for example regarding safety they describe based on their work. One question also highlighted was how the police officers experienced the large increase in the number of A-tractors. It was also of interest to get the police's description of any difficulties they experience in their work and what actions are needed to reduce the risks that can exist with A-tractors and moped cars.

Semi-structured interviews were conducted via video meetings and recorded with the participants' consent. The data analyses of the transcribed interviews were carried out according to a method described by Graneheim and Lundman [2004]. Initially, the transcribed interviews have been read through several times and the analyses were made in collaboration between the two authors. In the qualitative content analysis, sentences or phrases were selected, so-called meaning units, which contained aspects related to the purpose. Based on similarities and differences, the meaning units were condensed to codes and the codes were furthermore analysed into categories. Each category was analysed and main categories with subcategories merged. For an example of an analysis scheme, see Table 9. During the analysis process, the authors discussed and reflected on the results together to obtain consensus.

Table 9. Example of analysis scheme for two of the identified categories.

Meaning units	Subcategory	Category
<i>I think it's two different people who drive these vehicles, and they don't have much more in common than that they're young...It's dad's old car that has been rebuilt and you go to the stables, to hockey or to soccer practice. It is a utility vehicle...</i>	EPA culture and group affiliation Rural and urban areas of use and means of transport	Youth car - a social phenomenon
<i>The old type of A-tractor has disappeared so that you can drive more fuel-efficiently, which was perhaps one of the reasons why the regulations were changed. But then it became super easy to modify the vehicles. But there are so many thousands of A-tractors that you don't have time to do everything</i>	Need for a change Resources and skills	Legislation and the work of the police

The quotations in the results section are translations of the Swedish quotations which were originally presented word for word with only minor adjustments in some cases to increase readability. In cases where words or sentences have been omitted from the quotation, this has been marked with /.../. Clarification by the authors is marked with [text].

4.2. Result

Of the content analysis, the result can be described based on four main categories. Each category consists of two to three subcategories. Categories, with subcategories in parentheses, are as follows:

Category 1: Youth car – a social phenomenon (“EPA culture” and group affiliation, Rural and urban use and means of transport)

Category 2: Impact of drivers and vehicles (Impact on road safety, Impact on other people, Impact on environment/climate)

Category 3: Reporting and controls (Driver behaviour and accidents, Reasons for reporting, Vehicle inspections)

Category 4: Legislation and Police work (Need for change, Resources and competence)

The following is a presentation of the results based on the identified categories. Categories and subcategories are illustrated through quotations.

4.2.1. Youth cars – a social phenomenon

“EPA culture” and group affiliation

EPA and A-tractors have been around for a long time, but the large increase is linked to the regulation changes for A-tractors in 2020. In contrast to the previous rules and the older vehicles, the police officers meet a different group of drivers that now do not necessarily have a particular interest in motor vehicles. In the past, mostly older Volvo cars were observed on the roads, but today there are newer and more expensive cars (in some cases even Porsches) and large pickups. The following quotes illustrate the different types of A-tractors, but also that they are used for fun as "play vehicles":

I see the A-tractor as a good vehicle to get somewhere when you live in the countryside. But it is obvious that many have become play vehicles, especially with the old Volvo 740 and 940. After all, it's a play vehicle. The children are out driving a gravel road.

Now you have nice cars. Which means that you have kind of broken for everyone. You can have a Porsche Cayenne as an A-tractor. You can have a Volvo V90 as a tractor. We don't need to have an old Duett that smells of diesel and leaks oil, but you can have it nicer and then it has kind of spread with the EPA music and the EPA culture.

All police officers describe a very large increase in the number of vehicles in their work area and that more young people now drive some kind of vehicle with their AM-licence, which can be a two-wheeled moped, a moped car or an A-tractor. The police agree that there are different groups or individuals who drive moped cars and A-tractors respectively (see further below regarding moped cars). The drivers of the A-tractor are often more interested in motors, and a police officer expressed that these were the car mechanics of the future, as some have older vehicles that often need to be repaired. Among many drivers, it is popular to "pimp" and change the appearance of A-tractors with, for example, tinted windows (side and front windows), interiors, lights and rims. According to the police, it also seems to be important that the vehicle has a good sound system so that the young people can listen to their favourite music, and a special genre of music has become popular in Sweden, the so-called “EPA-dunk” (which can roughly be translated to EPA-beat).

You want to be seen, you want to be heard, you want to be somebody. At this age, a group of friends is incredibly important and you are eagerly cheered on even by friends.

My understanding is that moped cars have young people who want to go to their training or friends and A-tractors are more of a social phenomenon, out playing and showing off and a lot of bling bling like lamps, "Poppy's" and stickers.

From the quotes above, it is clear that the design of the A-tractors and the importance of belonging to a group is important, and that can be described as a youth culture or specifically an "EPA culture". The police report that many people gather at specific meeting points, usually a parking lot, gas station or fast-food restaurant, where they socialize with other motorized youths. The police describe this as a kind of rolling youth centre and that the young people often drive around with the vehicles to socialize, not to go to a specific destination.

It's like a rolling youth centre, and then it's mainly A-tractors. So, I see a clear difference in culture between a moped car and an A-tractor. A-tractor is more of a culture, that it becomes a thing around, while my view is that moped cars are more of a means of transport.

The drivers of A-tractors seem to consist of two types of groups. In recent years, police officers have noticed that there is another group of A-tractor drivers who are not as interested in the vehicles or the "EPA culture", but that they mainly use the vehicle to move around, similar to the moped car driver. Unlike the drivers of A-tractors who are more associated with the "EPA culture", these drivers do not interact with the vehicles in the same way or congregate in parking lots, for example.

Rural and urban areas of use and means of transport

The police see advantages with the vehicles and that they are a practical means of transport for those who live in rural areas or a good complement to public transport. The police officers understand that with the A-tractor, young people can be more independent, everyday life is easier and parents do not have to drive them to activities and their friends. Unlike two-wheeled mopeds, A-tractors or moped cars are used more extensively all year round, regardless of the weather. The police officers also notice that the vehicles have become very popular among both girls and boys. However, the vehicles are not only found in rural areas, but they are used almost everywhere, possibly not in the centre of the largest cities, but still where there is a well-functioning public transport and cycling distance to school or leisure activities. The following quotes highlight this type of use of A-tractors:

... Perhaps mainly girls who have the vehicle to drive to school. We haven't really seen that category before, maybe it's those who don't want to drive to school in an old Volvo, but they have got a half-new car of some kind that looks sensible and fresh, converted to A-tractor. And then you have it to drive to school and activities or so on. /.../ They are not motor enthusiasts, but they have been given a vehicle by their parents. They are usually relatively expensive and cost as much as a car. So it's the parents who, instead of driving, buy the vehicle and we didn't have that category at all before.

Since the new rules were introduced, the police believe that many "newer" A-tractors have replaced the moped cars, but what they have in common is that they are mainly used as a means of transport to school or some leisure activity. Some police officers also have experiences that the newer A-tractors have some form of social status among young people, perhaps even among the parents, even though there may not really be any special need for a vehicle as most of them live in central areas. It is also considered better to drive an A-tractor than a moped car or a two-wheeled moped as it is perceived as safer. However, some police officers think that the parents should take more responsibility for the vehicles and their young.

Moped cars may be too expensive for many, but they may be a little more maintenance-free for the parents who buy them. The moped car is described by the police as "a moped with a rain cover" and often gives a false impression of safety for young people. On the other hand, there does not seem to be any major problem with moped cars and the drivers' driving behaviour:

There are probably more complaints that they are in traffic, that they may slow down or not really follow traffic rules and so, but we have no worries in that way with the moped cars.

The police agree that there are not the same problems with illegal modification or mischief for moped cars as there are for A-tractors. However, there may be a slightly higher problem around drunkenness, which may be due to the fact that young people know that the police rarely stop a moped car.

4.2.2. Driver and vehicle impact

Impact on road safety (deliberate changes or shortcomings)

The reports about adults who make a living by converting vehicles into A-tractors, and an end-of-life car bought for 25,000 SEK can be worth 50-60,000 SEK when it is sold as an A-tractor. "Pimping" and modifying the vehicles is often associated with the A-tractors. Curtains and tinted windows are common and can affect the driver's visibility, but also make it difficult to interact with other road users who do not make eye contact with the A-tractor driver, for example at pedestrian crossings or in roundabouts:

Tinted windows are very, very common... And the dangerous thing about that is that when you can't look out of your side window, then you put the rear-view mirror out of order.

The parents feel confident that they are buying a safe A-tractor because it is a former passenger car and it is perceived as safe for the young person to transport themselves in. However, all police officers who were interviewed described that it is very common with defects on the A-tractors, despite the fact that they may be relatively new vehicles. The police officers describe, for example, that during checks they discover that the handbrake, lights or similar, do not work on the vehicles, which can affect road safety:

I stop a lot of A-tractors and I would say that everyone, all A-tractors have deficiencies. /.../ The thing to remember is that... What is it? Well, it's a discarded car, basically this car has done its job as a passenger car and now it has become something else. It has gotten a little worse. And if it had been good as a car, it would still have been a car. But it's discarded and we let the youngsters drive it.

It is also common to make deliberate changes to the A-tractor that involve road safety risks, such as the removal of the suspension and LGF plate (triangle for slow-moving vehicles) or vehicle tuning to be able to drive at a speed higher than 30 km/h. Making stiffer suspension, removing suspension and lowering the vehicles affects the tires and handling. The vehicle becomes difficult to steer and increases the risk of breakdown, i.e. that the suspension breaks. The police suspect that this may be the cause of several single-vehicle accidents, and in combination with speeding, i.e., vehicle tuning, it becomes even more dangerous in traffic. The following quote describes examples of shortcomings and vehicle tuning:

We have various lighting problems. Handbrakes are very common. The horn works well in half of the cases I'd say. Tires are also quite common.

We inspected one the other day that was taken by the police and we found probably eighteen deficiencies. Broken tires. There are lights that don't work, tinted side windows and the windshield with very dark sun film.

Another common deficiency that the police complain about is the LGF plate. For example, it is cut or bent where the license plate should have been, or it is located in the rear window. The position of the sign can mean an incorrect angle and a poorer visibility to be detected by other vehicles behind. The following quote describes the problem with signs:

There are quite a few A-tractors that still have their license plate at the back plus an LGF plate and it can be on Velcro for example, so that it is quite easy to pull it off and then you drive when you want to drive faster out on major roads, and then you stop and then put the LGF plate back.

In other words, an LGF plate should not have wing nuts that can be unscrewed by hand. Why do you put an LGF plate with Velcro? Why do you put it with cable ties? Why don't you just screw it in? It's because you want to be able to take it off a little quickly and easily.

An LGF plate is the responsibility of the vehicle owner and must be clearly visible. During the winter, snow and ice are also not removed. The police describe that the shortcomings around the LGF plate pose a danger in that others do not notice that it is a slow-moving vehicle, especially drivers from other countries who are not familiar with these types of vehicles. Some police officers say that incidents have occurred because other motorists have not noticed the slow-moving vehicle in time. Several police officers also have experience of drivers removing the LGF plate to make it easier to drive at higher speeds without being detected.

There are various ways to limit the speed of an A-tractor to a maximum of 30 km/h, but most are circumventable in some way. With modification or tuning, the vehicle goes as fast as on the original vehicle. This is described by several police officers as relatively easy and something that the young people themselves do, but there are also rogue companies that convert cars into A-tractors and who can "help" so that the vehicle can be driven at higher speeds.

Impact on other people

The complaints from citizens often involve young people who gather with their vehicles in large parking lots and commercial areas and are described as mainly about littering, loud music and young people driving around and skidding. Some police officers also give examples of frustrated citizens who have trouble sleeping and are very negatively affected by drivers driving around their homes playing loud music and making noise. In one place, the problems became so great and mentally stressful that people moved from a residential area. Below are examples of the police officers' experiences of this:

... And then there were seven of them in it, three of whom were sitting on the flatbed. Like, there's this reckless behaviour in traffic and a lot of noise at the pedestrian crossings and then people are disturbed when you play really loud music.

We get every now and then, go on alarms or what to call it, that people call in because they can't sleep and there is a lot of music played and it skidded too much and so there and then it's always A-tractors.

They can't sleep at night, the kids wake up, the windows rattle... /.../ so then they go there and try to chase off these kids so there will be a little cat and mouse game then...

The police officers mention problems with accessibility for other road users, and especially on the roads where it is not possible to pass a slow-moving vehicle. It is mentioned that in addition to passenger and freight transport, emergency vehicles can also be affected in these contexts. Complaints to the police can also be about the speed of the vehicles, that they are going too fast or that they are going too slowly. Police officers sometimes receive complaints from other road users that the drivers of moped cars and A-tractors do not follow traffic rules, such as giving right of way, using turn signals or not driving to the side to make it easier for others in traffic.

You can't just drive around skidding and things like that with a moped car like with an old rear-wheel drive Volvo or BMW, for example. It's the kind of behaviour that people get annoyed with us if they get in touch with us.

The police understand that many other road users are annoyed by the vehicles and that the vehicles obstruct the accessibility of others. They have seen situations that have involved dangerous overtaking, but few know of any specific accident that has occurred because of this. However, one of the police officers had an example:

As well as made a quick overtaking. It is not the A-tractor that has caused it, but they have seen too late that it is A-tractor, and misjudged an overtaking and made an overtake and driven into something or someone.

Impact on environment/climate

In order to achieve our climate goals, citizens must try to refrain from or limit car driving in order to reduce harmful emissions. The legislative change implemented for A-tractors meant to give a newer fleet of vehicles and more modern A-tractors, which would reduce emissions. Several of the police officers do not see any climate benefit from the rule changes, rather the opposite. Instead, the changes contributed to a very large increase in the number of vehicles and, according to the police, these are mainly used to drive around and socialize. Vehicles have largely replaced public transport or active modes of transport such as cycling or walking. In addition, an electric vehicle cannot be converted into an A-tractor, but the vehicle must have an internal combustion engine. On diesel cars, the police say, the particulate filter needs to be removed when the vehicle is going at a maximum speed of 30 km/h, because the particulate filter only works satisfactorily at higher speeds.

An A-tractor has no emission requirements, it can emit whatever it wants. And if it's a diesel tractor, the young people think it's cool when it smokes.

It's the same with the exhaust system. It says [in the regulation] that it can go straight up on an A-tractor, through the hood.

The environmental requirements for an A-tractor are not the same as those for the original car and the regulations have no requirements for emission control systems. For many people who drive A-tractors, trends vary with the appearance of the vehicles and how the vehicles change and are "pimped". Some police officers say that it is popular among some drivers that there is heavy smoke from vehicles with diesel engines, and which sometimes also have modified exhaust pipes. This is done by turning on the diesel pump, which causes more diesel to be pushed into the engine and which results in a strong black, carcinogenic smoke:

There will be big, black clouds of smoke, that is. It's trendy among some people who think this is really cool, so there are also environmental aspects here...

4.2.3. Reporting & Controls

Driver behaviour and accidents

It appears from the police interviews that it is common for the young people not to wear a seat belt even though a belt is in the A-tractor, or that the person has fastened the belt behind his back. Despite the fact that moped cars have a requirement for seat belts, this habit seemed to exist also for these drivers. Since August 2023, seat belts in A-tractors are required by law, but according to the police, the young people do not understand the point of using a seat belt at low speeds. The police are also concerned that the bad habit of not wearing the seat belt in A-tractors and moped cars may persist even when the individuals start driving passenger cars:

You learn to sit without a belt and it becomes a gut reaction to never put on the belt afterwards. You kind of learn to find shortcuts in traffic, bad behaviours and you will do the same when you are 18 and get your driver's license.

The officers had experience of people who had been injured because they had been in the trunk or had stood on the roof of the car and "surfed". Most of the accidents that the police are aware of includes drivers and passengers that have been seriously injured or killed, and where they have been speeding. However, the police feel that the number of unreported accidents is very high and that many do not contact the police or health care in the event of minor accidents:

I don't think we've had anyone who has been involved in an accident and vehicle tuning hasn't been involved.

The police believe that there are many single-vehicle accidents, but these are rarely brought to their attention because the drivers solve the situation themselves (if there are no or minor injuries). Examples of this are given in the following quote:

The public calls that it's an A-tractor that has driven into something or driven off the road and then we are ordered there and when we get there they are gone and the kids themselves have not reported it to the police. So there is a large number of unrecorded cases, I think, with A-tractors in traffic accidents.

There have also been accidents where the A-tractor has been hit from behind, but it has been deemed unclear who is to blame due to the fact that the LGF plate was not correct, i.e., to be able to warn other vehicles. A police officer gave an example where a driver had driven into an intersection but had not applied the obligation to give way, and because the vehicle was driving so slowly, the car behind it did not have time to brake.

Reasons for reporting

Reports from the police include, for example, deficiencies in the vehicles, tinted windows, disruptive driving and unauthorized modifications. Unlicensed driving, i.e. that the driver drives a vehicle that the person is not authorized to drive, can mean a new registration inspection, which can be both costly and difficult for the individual. Some of the police think that a requirement for a new registration inspection is effective, but at the same time some young people do not seem to care about the consequences, whether they are fined or prosecuted. Despite the fact that the license has been revoked, some people continue to drive illegally once they get their license back. In the interviews, it is highlighted that parents may be aware that the children are breaking the rules, but that it may also be that the children have better knowledge than the parents:

Yes, although it may be quite obvious that the parents know about it. Then there's a bit of ignorance. The kids have a better grasp of the regulations than the parents often do.

Since the rule change in 2020, it has become easier to tune the vehicles to go faster, and police officers are very frustrated with the situation. Tuning an A-tractor so that it goes faster than the permitted speed (30 km/h) is, in the legal sense, to convert it into a passenger car, which requires a different level of maturity, knowledge and also competence (B licence) to drive. Unauthorised changes mean that the police can report unlicensed driving if the young person is not authorised to drive the vehicle. A parent can also be reported for allowing unlicensed driving if the child drives a vehicle that is tuned to higher speeds. If the driver is reported for driving without a licence, the driver's licence and driving licence permit may be revoked. However, to report unlicensed driving or illegal modification, forensic evidence is required that can involve great efforts and challenges for the police, as illustrated in the following quote:

We do a lot of inspections and there are a lot of people who are suspected of unlicensed driving and then we have only scratched the surface...

After all, there are always ways and there are companies that will probably help you. Because it's a way to make money too. But I don't think you can ever get away from it [vehicle tuning] completely. That I think I'm impossible actually.

The vehicle tuning does not require any extra cables, but can usually be done by programming. On older cars, it was easier for the police to find how the vehicles were tampered with, but nowadays it is much more complicated and time-consuming. The police describe how easy it is to program, but difficult or almost impossible to find. In addition, the tuning is sometimes carried out in such a way that it is not visible when it is not in operation and no traces are left that show that the vehicle has been tampered with in the past:

And when the police come, they snatch that cable and of course we can see that there was probably a cable there. But there are no traces left. If you do it right, yank the cable and throw out the cable, there is nothing to show that it has been tampered with.

To test drive it, we have to sit and test different buttons [controls on the dashboard]. It's almost like cracking a safe. It can be any button.

... These old Volvos, they're incredibly easy to manipulate and we always find them. But if you take a fairly modern car, Volvo 2011-2012, then you have to go in the computer and check and it's not always that we find it because we're behind all the time. The young people are much smarter than we are, we are always one step behind.

In an A-tractor, the rear seat and luggage compartment must not be accessible, and passengers must not travel in the rear seat. That this still happens is common during inspections and when remarks are reported. In addition, several of the police officers recount that in connection with checks, passengers have been discovered who have hidden in the trunk or similar. A police officer also tells of an accident where a person was lying in the trunk, and in connection with driving off the road at high speed, the person was injured. Here are some other examples of the police officers' experiences in this regard:

It's quite often they have a back seat, then you have a small shelf with holes for beer cans and stuff in the back and then you have to drive your friends around... So relatively often when we stop, there's someone lying there, for example.

We had decided to confiscate this one there and then on the spot, and the tow truck was on its way... /.../ and there was a handle so then I opened it, and then there was a girl there hidden in the back seat, completely silent.

The police's view is that alcohol and drugs rarely seem to be a major problem among the young drivers, especially not among the drivers of the A-tractors.

Inspection of the vehicles

When a motorized vehicle is converted into an A-tractor, a registration inspection must be carried out by an accredited inspection body before it is approved for use in traffic [Swedish Transport Agency, 2023c]. The registration inspection describes how the vehicle should be constituted, which becomes the police's form of "answer" during checks. Since 2018, A-tractors have also been inspected every two years, which the police feel has led to a reduction in the number of older and dangerous vehicles. During the roadworthiness test, the vehicle must be checked to ensure that it meets the requirements for equipment and condition as set out in the regulations, which may include, among other things, checking the wheel system, engine and driveline, lighting and braking systems. However, the police describe that a lot can happen during these 24 months, such as wear and tear and changes to the vehicles. Unlike a passenger car, an A-tractor has lower inspection requirements and major deviations are accepted before it leads to action requirements. In addition, the police often discover major defects in the vehicles, even though they have recently been inspected:

And they really only check that it's in a roadworthy condition, like that the lights are working, that the tires aren't damaged, that the brakes are working. Then they are not required to check so much else.

We can take an A-tractor that was newly inspected maybe 2 to 3 months ago and easily find ten faults and then we are not very picky.

In addition, the police feel that parents rarely check the vehicles and that they may trust their children too much. It appears that it is common that shortly after the inspection is completed, the tuning of the vehicles is completed:

That makes it a little more difficult, because then they [the inspection company] approve the A-tractor in its entirety and then two hours later we might stop it and discover that it's going too fast, and the kid is suspected of driving without a license. Then the parents will be questioning, which I understand, when it was just inspected and they let it through.

The inspection industry with its various actors and companies that work with inspections was discussed extensively by most of the interviewed police officers. Some companies were perceived to be very serious and reported faults in the vehicle, which could mean that customers instead chose or recommended other companies. In addition, the police officers felt that the knowledge of the requirements for inspecting A-tractors differed greatly between the stations, as well as the competence and interest in the vehicles. The police were also aware that some A-tractor drivers/owners turn to companies located in other towns, even though there are local companies. These companies carry out frequent registration inspections and are perceived by the police as less serious. Perhaps there is a need for more frequent inspections of the companies by the authorities, according to one of the interviewed police officers. A problem that is raised in this context is that the inspection companies are profit-making companies:

And unfortunately, the vehicle inspection companies are not state-owned either. They're a for-profit company, they want repeat customers, so they probably have an easier time turning a blind eye than us in the police who are quite strict about that. Because if the vehicle inspection companies don't do what they're supposed to do and we don't, then it becomes dangerous. /.../ They see flaws with the speed governor, that the seal may be broken on that box... /.../ But they should not do anything about it, it is the police's job. And there are a few thousand A-tractors just where my colleague and I work. After all, we will never be able to control all A-tractors. It shouldn't be up to the police to do those checks either.

4.2.4. Legislation and the work of the police

Need for change!

Most of the police officers interviewed are generally positive towards A-tractors and moped cars and understand its benefits for young people's mobility in rural areas. However, they wish that the authorities had involved the police more in the 2020 regulation change, and specifically traffic police who meet the target group. The police are surprised that the rules for A-tractors were changed when much of the problem could have been foreseen. Better legislation on vehicle tuning and driving without a licence would have made it easier for them to work. Several police officers give examples from their everyday lives when the use of lasers has not been enough in a speed control without the need for proof of how the change in speed has been made. According to the police, getting a driver convicted of driving an A-tractor without a licence is associated with a lot of challenges. The majority of police officers are critical of the legislation, which is also perceived as very complicated:

I think this whole piece of legislation is a bit out of date, it's well based on the EPA proclamation from World War II. Then it has been renewed a bit over time and become the regulation that it is today. There is, of course, a great deal to be desired from this provision.

The legislation on driving without a licence is incomprehensible to me, I have not received any sensible answer anywhere, so it is a deliberate crime.

Traffic offences are generally considered to have too low a penalty value and irresponsible driving behaviour should lead to a sanction that is severe, "it should be easy to prosecute and provide a consequence, and it should be severe", as one police officer put it. The amount of the fine is usually so low that it is not noticeable to the individual driver or that it is a deterrent, according to the interviews. There are rarely any major consequences, and if the AM licence is revoked for, for example, driving without a licence, the driver will get it back within a few months. Some police officer mentioned the proposal from the EU with a new driving licence (B1) that could possibly be an option in the future, where you can drive a passenger car from the age of 16 but at a maximum speed of 45 km/h. However, there were doubts as to how manipulations could be controlled in the light of the Swedish experience.

The police are positive about the new rules on, for example, seat belts and the number of passengers, but do not think it is enough. There is a need for more changes and better cooperation between the authorities. The perception of a lack of cooperation is reflected in the following quotes:

These are the Swedish Transport Agency, the police and the inspection bodies. I don't think we speak the same language or with each other... We don't have a consensus on how a vehicle should be... /.../ The Swedish Transport Agency changes a little bit there and the others, the inspection bodies, they do a little bit as they want. And then we stand there and try to follow a set of rules that we can't reach, because it's so strange.

But the role of parents is also brought up in the interviews, and where changes in legislation could have an effect:

But also, perhaps, to transfer responsibility to guardians if possible. But it's hard, because often they're accomplices.

In order for us to get to grips with this, we have to change the legislation and put the responsibility for intent on the driver and the parents.

Resources and skills

There is some ignorance among the parents, the police have experienced. In addition, there is concern that the parents do not check the vehicles more, so that everything works and looks as it should, such as the lights and the condition of the tires. Some changes are also more obvious than others, such as ornate in comparison to manipulation:

That's probably what amazes you the most, that you take the absolute most valuable thing you have and let them drive around, without a belt, in a manipulated A-tractor, preferably with a lot of sharp edges everywhere...

Furthermore, some police officers feel that some parents can be more difficult to communicate with, compared to the children:

It may be that the young people themselves are very good to deal with, but the parents... That's when the hard part comes. The adolescent can be great until the parent arrives. It could be that the youngster is about to admit how that [A-tractor] is being manipulated and then the parent comes over and is like, "Now you're quiet, don't say anything more" and so on.

Some parents understand exactly what I mean and are grateful, and some parents have a little more difficulty understanding my message and are angry at us for prioritizing the wrong things in society, that we might have to work with the more serious crime.

Some police officers also mentioned the problem of the lack of adults in areas where the young people spend time and that the vehicles become a kind of rolling youth centre, where the group of friends rules. Thus, there is no adult who takes responsibility, and the police officers feel that there is a great need to be present at these places, but at the same time it is difficult to manage in addition to all other tasks. In addition, there are few police officers who have training in the field. Here are quotes that reflect the lack of resources expressed by the police officers in the interviews:

But as long as this problem exists, the police must allocate staff to work against the problem. If the problem hadn't existed, we might have had other tasks.

Then, of course, I have to be out there, I can't relieve this on society. But society can't just say that the police should take care of this, because we can't fix this.

It takes quite a lot of proof from us for it to hold up in court. And then there's the problem that there are too few of us who have flying inspections [special education regarding technical inspection]. In our local police area, we have one person who is allowed to carry out flying inspections.

Several police officers talked about how rewarding they thought it was to work with the young people, but that it was important to have the right treatment. In many cases, the contact is a form of education, so that the young people understand the importance of driving safely. The knowledge and skills of police officers are also in demand by many, such as schools that want lectures. This is carried out by some of the police officers while other police officers have to decline due to excessive workload.

The amount of work required to technically check a vehicle suspected of tampering was highlighted by most police officers as a major problem. It is very resource-intensive to be able to prove that illegal modification has been carried out and the police are also dejected about how difficult it is to prosecute the crimes and get a conviction. A police officer estimates the time to carry out a technical inspection of an A-tractor at nine hours and believes that these tasks could perhaps be carried out by another operator.

5. Summary discussion and proposals for action

A-tractors and moped cars are two types of vehicles that have become increasingly popular among young people in recent years in Sweden. Originally, the idea was that the rebuilt car would be a tractor for use in forestry and agriculture, but nowadays it is almost exclusively a youth car. The drivers and the vehicles are widely discussed in the Swedish media and most people have an opinion on the advantages and disadvantages of the vehicles. However, there is limited research on A-tractors and moped cars, but more knowledge and facts about motorized youth are also needed in general, especially when it is such a current phenomenon. As the popularity has increased, personal injury crashes involving these vehicles have also increased, something that has become clear in the crash statistics [Swedish Transport Agency, 2023b].

The aim of the project has been to increase knowledge on crashes with A-tractors and moped cars, mainly when it comes to those who are injured in collision crashes, and to describe how these vehicles affect road safety and the security of other road users. In the chapter on crashes, there was also some information on two-wheeled mopeds, but here in the summary discussion, the focus is on A-tractors and moped cars.

The project included various research questions (see section 2), which are provided below based on the results of the crash and interview study.

5.1. Crashes involving A-tractors and moped cars

A basic question in the project was whether there is any difference in crashes and injuries between young drivers and passengers in A-tractors and moped cars. However, this was difficult to investigate when there are no statistics on how many of the registered vehicles are used for the 14–20 age group in question. The statistics produced by Transport Analysis [2023] and presented in chapter 1 shows that between 2016 and 2022, there were on average 2.5 times as many A-tractors as moped cars, see calculation in Table 10. That ratio could also be valid for the target group and could be used to compare the ratio of crashes between the two groups of road users. In addition to this, the modes of transport are very different where the A-tractor is considered safer because it was usually a passenger car from the beginning, but even though it is only allowed to be driven at 30 km/h, it is sometimes driven at higher speeds. A moped car can be driven at a speed of 45 km/h, but it does not have safety equipment and the driver of a two-wheeled moped is an unprotected road user. Thus, the different types of vehicles are difficult to compare.

Table 10. Number and ratio of A-tractors and moped cars, 2016–2022. Source: Transport Analysis, 2023.

	2016	2017	2018	2019	2020	2021	2022	2016–2022
A-tractor	20 352	21 569	22 677	25 419	33 209	44 788	52 711	
Moped car	6 901	8 924	11 222	13 491	15 338	16 454	16 948	
Ratio (A-tractor/moped car)	2,9	2,4	2,0	1,9	2,2	2,7	3,1	2,5

In the crash study, we can state that during the time period (2016–2022), there were 44 fatal crashes and serious crashes involving A-tractors and 12 serious crashes involving light quadricycles where the driver of one of these vehicles was 14–20 years old. Overall, the number of crashes (fatal and serious) with A-tractors is 3.7 times higher than with moped cars (44/12). This calculation experiment could show that the risk of serious crashes with young drivers is higher in A-tractors than with young drivers in moped cars, when we relate serious crashes with the vehicles to the relationship in number of vehicles (2,5). What has been done is to compare the ratio between the number of vehicles and the ratio between the number of serious crashes and the number of serious crashes and the number of vehicles for A-tractors compared to moped cars. This indicates that there have been relatively more

serious crashes involving A-tractors than moped cars involving young drivers and their young passengers. If moderate and minor crashes with each type of vehicle are compared, the ratio is 2.4, which indicates that it is the more serious crashes that are more common with A-tractors than with moped cars. Seriously injured young people, including fatalities, have also been compared in each type of vehicle and the ratio is 3.9, which means that the young people are more seriously injured in the A-tractor.

According to crash statistics on fatal crashes and serious crashes involving A-tractors, 66 percent were single-vehicle crashes. In serious crashes involving moped cars, 42 per cent were single-vehicle crashes, which is a much lower proportion. Single-vehicle crashes were also common, according to the police officers interviewed. However, the police suspect that they only find out about a fraction of all crashes, unless there have been any major injuries.

Nine out of ten of the serious crashes involving A-tractors occurred during leisure time, and the rest on the way to or from school. Among moped cars, seven out of ten occurred in leisure time and the rest on the way to or from school. Although the data material and the number are not large, it can be interpreted that a higher proportion of A-tractor crashes compared to moped car crashes, occur during leisure time. This is in line with what the police report, that they to a greater extent observe A-tractors driving around in the evenings and weekends compared to moped cars. In the crash statistics of all severity levels, the share of A-tractor crashes was also slightly higher than that of moped cars in the evenings and early nights, which was particularly evident on Fridays and Saturdays. This reinforces the image of A-tractor driver's use of the vehicle in their spare time, but it could also be interpreted as meaning that the use in their free time is riskier than driving to and from school. In addition, the police reported various misconduct (see section 5.3) which often occurs, but which become more dangerous when combined with the tuning of speed and when young people gather in groups and drive their vehicles more like 'play', as well as when this takes place in the evenings and in the dark. According to the crash analysis, a slightly higher proportion of A-tractor crashes, compared to moped car crashes, in the dark.

Crashes involving A-tractors (all degrees of severity) were more common than crashes involving moped cars in rural areas and on roads with a speed limit of 70 km/h or higher. In a densely populated area, the driver of an A-tractor is less likely to be injured because the vehicle is safer than the moped car. On the other hand, the A-tractor driver travels more in rural areas and drives on roads with a higher speed limit where surrounding traffic maintains higher speeds. In addition, the A-tractor may be tampered with and driven at higher speeds, which can lead to serious injuries in the event of a crash. In the crashes in which the interviewed police officers were involved, almost all A-tractors had been tampered with. The police have also testified that the A-tractors are in poorer condition, for example in terms of suspension (which affects manoeuvrability) and tires, which is not a good combination with high speeds. Speed affects the number of crashes and the outcome of injuries in several ways, partly the reaction distance and the possibility of avoiding a collision or crash, partly the crash violence and injuries in the crash [Vadeby, 2021].

Some gender differences were found in the examination of the more serious crashes, including fatal crashes. In the more serious crashes involving A-tractors, 91 per cent of drivers were men and in moped car crashes, 42 per cent were men. Generally, men's share of fatal crashes is 75 percent [Transport Analysis, 2022], but in the present study's statistics, the number of crashes is few, and also includes serious crashes. Comparisons are therefore difficult to make, but the gender distribution in crashes is probably a reflection of who uses the respective vehicles, where they are driven and what risks are taken.

5.2. Road users in crashes involving A-tractors and moped cars

From the police interviews, it emerged that it is common for passengers in A-tractors in particular to travel riskily. There are often more passengers than there are seats, and they sit on each other's laps, on

the centre console, in the back seat (which is not allowed) or even in the trunk. The police also told of people who had been standing on the roof of the car and "surfing" while driving. In many cases, these behaviours or incidents come to the attention of the police when they check the vehicles or in connection with a crash that has usually resulted in personal injury. The interviews also show that many crashes have occurred in connection with skidding and "playing" with the vehicle and in almost all cases the A-tractor has been tuned to higher speeds.

Overall, there are a number of crashes in which other road users have been injured, usually due to excessive speeds, lack of supervision and regulatory compliance, or irresponsible driving behaviour. The crash analysis confirms what the police have observed. There were also several examples of young people in single-vehicle crashes with a fatal or serious outcome being on the platform of the A-tractor and being thrown off. It is very likely that in these crashes the speed was too high than was appropriate when the vehicle was cornering or turning and skidding. There are usually more passengers in A-tractors than in moped cars, which becomes clear when the more serious crashes are examined. In A-tractor crashes, the driver and sometimes up to three passengers may have been injured (although not all of them were seriously injured), while in moped car crashes there was one crash with injured drivers and two injured passengers; in other crashes, a maximum of one passenger and/or driver is injured. Here, there is a hope that the requirements in A-tractor regarding seat belt use and limited number of passengers from August 2023 will lead to a reduction in injured young people in A-tractors.

Although a large proportion of crashes involving A-tractors and moped cars among young people are single-vehicle crashes (see section 5.1) it can be concluded from the list of fatal and serious crashes that other road users outside the vehicles were also injured. In two of the seven fatal crashes involving A-tractors, vulnerable road users were killed, while the drivers of the A-tractor were slightly injured or not at all. Eight of the 37 serious personal injury crashes involving A-tractors also involved seriously injured road users outside the A-tractor. In these crashes, no one in the A-tractor was seriously injured.

Many parents choose an A-tractor over a moped car or two-wheeled moped for their youngsters with the idea that it should be safer for the young person [Selander et al., 2023]. It is of course important to have a safe vehicle, but an awareness should also be conveyed that the A-tractor is usually a large and heavy vehicle and can injure other road users, especially if it is tampered with and driven at higher speeds.

In crashes involving other counterparties where the driver and passengers of the A-tractor were seriously injured, the other party's vehicle was larger and heavier (truck and bus). The crashes would not have had to happen if rules had been kept and consideration had been taken. According to the police, rear-end collisions are relatively common where the A-tractor or moped car has not noticed or complied with the obligation to give way, and due to their low speeds, the vehicles behind them, travelling at a much higher speed, do not have time to brake or adapt their speed in time. Lack of experience is an important explanation for young drivers' involvement in crashes, which can manifest itself in insufficient scanning of the traffic environment [Englund et al., 1998]. There were also other road users who were seriously injured in moped car crashes, which in some crashes could be due to a lack of attention and the fact that the driver of a moped car did not follow the rule on the obligation to give way to oncoming traffic.

5.3. The driving errors and behaviours

According to the police, the illegal modification of A-tractors is the biggest problem and is common both in rural areas and in smaller or larger cities. Since the rule change in 2020, it is much easier to regulate the speed electronically, which makes it possible to rebuild newer and more modern vehicles than before [Swedish Transport Agency, 2022]. Moreover, for two-wheeled mopeds, there have previously been reports of high speeds and tuning [Gustafsson & Gregersen, 2011]. In addition, it is well known that many young people are influenced by their peers, which in traffic can mean that they

take greater risks and drive at higher speeds [Gregersen et al., 2015]. In the interviews with the police, it was mentioned that young people are often influenced by socializing and peer pressure, which means that, for example, manipulation is rarely questioned and could be a given part of the “EPA culture”. In addition, the parents are not always aware that the A-tractor is tuned as the manipulation can easily be activated and deactivated by an "on and off" button that only the youth know. In some cases, it is so difficult to detect in what way the tuning is carried out or how it is activated, that not even the police's technicians can find or understand how it is done (see more under section 5.4). At the Swedish Transport Agency, work is now underway to review the regulations on A-tractors regarding 1) technical requirements for speed limitation measures to make it more difficult to manipulate electronic speed control and facilitate its detection, 2) how the design speed should be determined, 3) clearer technical requirements for the LGF plate [Swedish Transport Agency, 2023d]. The plan is for the new regulations to enter into force in autumn 2024.

In some incident descriptions in Strada, it could be stated that the vehicles were driven at high speed. Sometimes it was the police's description, or the young person reported this to the health care services and noted it in the incident description. However, this data is not something that can be used to base any statistics. However, after reviewing the incident descriptions, it is clear that some crashes would not have occurred or had the consequences the crash led to, if the A-tractor driver had only driven at 30 km/h.

As in a previous study [Selander et al., 2023], the interviews with the police officers revealed that some young people removed the LGF plate and put the license plate back, which means that the drivers and vehicles are not noticed on high-speed roads and can drive at higher speeds. In addition, both studies have shown that it is common to have multiple passengers and not wear a seat belt. The police officers report how they try to get the young people to understand the importance of both the driver and passengers wearing seat belts, and they hope for a change in their behaviour with the help of the new legal requirement on seat belt use. However, they are concerned that the behaviours and bad habits are transferred when the young people start driving passenger cars, which are similar behaviours that the driving instructors reported in the previous study by Selander et al. [2023]. It is also clear from the number of passengers reported in many of the more serious crashes that more passengers than the vehicle is registered for have been travelling in the vehicle. This is especially true of A-tractor crashes. If there are more people in the vehicle than there are seats and seat belts, then of course the seat belt cannot be used. In Strada, the health care system has in individual cases noted whether belts have been used. Of the 37 serious crashes involving A-tractor, 17 crashes were recorded, of which seat belts had been worn by five drivers.

In crashes of all severity, the police's suspicion of the driver's alcohol influence is filled in in many of the crashes. Among known cases, i.e., where the police filled in “Yes” or “No”, the proportion of suspected drivers of alcohol was 6.6 per cent among A-tractor drivers and 6.4 per cent among moped car drivers, so about the same proportion. In the previous study by Selander et al., [2023], about five per cent of young people who drove A-tractors stated that they had driven drunk and about nine per cent of moped car drivers. When the young people described their friends, there were much higher proportions who reported having driven after drinking alcohol or taking drugs. However, the interviewed police officers were of the opinion that alcohol and drugs were rarely a major problem among the drivers, especially not among the drivers in the A-tractors. However, according to what young people say, and what the crashes show, drunkenness among young drivers of moped cars and A-tractors should be taken very seriously, and further research is needed.

5.4. The police's challenges in working with motorized youth

It is evident from this study and previous study [Selander et al., 2023] that A-tractors and moped cars are very popular vehicles among young people in Sweden. However, it is unknown how far the vehicles are driven during the years that they are used, but it seems to be frequent and sometimes they

are even used for longer distances. For future studies, this should be further investigated. The police officers mentioned in the interviews that they understand that the vehicles have been tuned because some young people drive the A-tractors a long distance for only one specific errand. The police agreed that the A-tractors are now only used as a youth car and they do not know that A-tractors should be used for agricultural chores, which was the idea when the vehicle type was added. Similar results have emerged in the Swedish Transport Agency's investigation of A-tractors [Swedish Transport Agency, 2022].

The A-tractors are valuable for mobility in rural areas, but it is evident from the vehicle statistics (see Figure 1), the police interviews and the crash statistics that the vehicles are common and used in both small and large cities. It is therefore not true that it is primarily a vehicle for rural areas. In cities and communities, they must interact and interact with other road users, which can lead to irritation from others when they obstruct accessibility, for example during rush hour or for emergency drivers and public transport. The police officers interviewed were well aware that other drivers in these situations could make inappropriate and, in some cases, dangerous overtaking, but crashes for such incidents were unknown according to the interviewed officers and have not been found in crash data from Strada.

The police believe that the new rules on seat belts, passengers, speed and winter tires are good, but are calling for further improvements and how different authorities should work and collaborate around the vehicles and their drivers. The police are often dejected about how they will manage to be able to check all vehicles that have various vehicle deficiencies or that are suspected of being tampered with. There are far too few police officers who have been trained to be able to carry out technical inspections, for example. In addition, it is a demanding and sometimes impossible task to be able to prove vehicle tuning, i.e., unlicensed driving and intentional crime in a trial. In addition, the police believe that it has too low a penalty value when a crime only gives SEK 1,500, which they understand that most young people do not care about. Today, some police officers find it difficult to carry out their work when the regulations are so complex and they are questioned in connection with reports of, for example, vehicle tuning, partly by parents and partly by lawyers during trials. In summary, the police see major problems with prosecution and call for a real overhaul. Furthermore, the police said that despite the fact that the vehicles have recently been inspected, major deficiencies are often discovered when the vehicle is stopped. The inspections at inspection companies are described as being of varying quality or that there is a lack of knowledge and competence among the inspection staff, which means that the A-tractors are not always sufficiently checked. The police describe the danger to road safety when the vehicles generally have lower requirements in combination with a lack of controls. Police officers are only able to check a fraction of all vehicles and A-tractors, which is not always a priority among all other police work.

Unnecessary and disruptive driving in residential areas was another aspect that emerged during the police interviews. There were also examples of when the problems had escalated and turned into large fights between residents and the motorized youths. In some cases, certain places had to be cordoned off for the safety of other citizens, such as parking lots or large areas at fast food restaurants. The problems meant that the young people disturbed others through loud music, littering and "burnouts". In some places, it has been reported in a previous study that the vehicles circulate at high speeds around an area with loud music, which has affected the residents' quality of life [Martinsson, 2019]. Crimes and disturbances can be reported or fined by the police. But in the interviews, several police officers also highlighted the importance of an offensive approach towards the young people and to have a good dialogue, both to prevent but also to inform the young people about regulations and road safety.

5.5. Proposals for action

AM-license training

AM-license training for driving four-wheeled vehicles needs to be changed and improved, as stated in previous reports and investigations [Selander et al., 2023; Swedish Transport Agency, 2022]. At the Swedish Transport Agency, a change process is now underway for regulations regarding AM-license education, which is expected to come into force at the end of 2024². It is of the utmost importance that the Swedish Transport Agency takes on board information about the training from other countries, Norway for example and what VTI's research has shown, in order for it to be a very good education that leads to safe drivers.

Information campaigns for young people and parents

In addition to improved education, it is possible that young people and parents need to be reached by more targeted information efforts. Here the films that The National Traffic Safety Association (NTF) has produced³ are a good initiative, but the efforts also need to be aimed at young men and young women respectively because the crash analysis has shown that young male drivers predominate (make up as much as 90%) in serious crashes with A-tractors, while young female drivers to a slightly greater extent (about 60%) are involved in the serious crashes with moped cars. In addition, there is a need for greater demands on parental responsibility, both with regard to vehicles and with regard to the behaviour of young people on the roads.

Evaluation of the law on seat belts

The legislative changes introduced in August 2023 regarding, among other things, seat belt use and the number of passengers in A-tractors will need to be followed up and evaluated. The purpose of such an evaluation is to see whether the change in the law is complied with and has changed the behaviour of the drivers and passengers of the A-tractor and moped cars, otherwise more intensified monitoring and other measures are needed. One problem in observational investigations or police surveillance is that it is difficult to clearly see from the front whether the vehicle is an A-tractor or a normal passenger car. Here, in addition to the LGF plate, some kind of marking from the front or on the roof of the vehicle would also be of great help for visibility.

Improvements to Strada

The analysis in the Strada accident database has revealed how difficult it is to find the vehicles and especially to be able to distinguish between moped cars and two-wheeled mopeds, both class I mopeds. In this respect, it would be desirable to have clearer registration so that the crash trends of each type of vehicle can be more easily compiled. A further improvement would be if all types of crashes, such as single, oncoming collision, rear-passing, crossing, etc., were accessible in an A-tractor crash without the need to read the incident description. All in all, several improvements are needed to Strada, which would make it easier to follow the development of crashes and injuries among A-tractors and moped cars in the future.

² <https://www.transportstyrelsen.se/sv/Regler/Regler-for-vag/pagaende-regelarbete/foreskrifter-om-behorighet-am/>

³ <https://ntf.se/bibliotek/informationspaket/for-a-traktorforare-mopedbilsforare-och-foraldrar/>

Alcohol tests

It is important for young people to understand that traffic and alcohol or other drugs are not a good combination. Therefore, more alcohol breath tests should be carried out when the police encounter motorized young drivers.

Increased cooperation between operators and inspections of inspection bodies

Greater cooperation is needed between the Police, the Swedish Transport Agency and the inspection bodies when it comes to the registration and inspection of A-tractors. The Swedish Transport Agency is the supervisory authority for the various inspection companies but would need to increase the controls based on what has emerged from the interviews with the police officers.

Increased resources and training in the police

The police need increased resources and training to be able to effectively work with motorized youths. This may mean that more traffic police officers receive training in the technical inspection to be able to check the vehicles on site, that collaborations are formed within the Police Authority with those who work with the target group to exchange effective working methods and methods, as well as interpretations of different sections of the law.

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