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Impact assessment for the Swedish Transport Agency's regulations and general advice on technical requirements for vehicle combinations with a length over 25.25 metres

The Swedish Transport Agency's proposals:

The Swedish Transport Agency's regulations (TSFS 2023:42) on technical requirements for vehicle combinations over 25.25 metres in length are to be repealed and replaced by new Swedish Transport Agency regulations (TSFS) on the design and equipment of vehicle combinations with a length over 25.25 metres and vehicles forming part thereof, together with the consequential amendments that are prompted by the regulations set out below.

The regulations permit three additional types of vehicle combinations over 25.25 metres in length. The draft requirements in the regulations aim to ensure that the current level of road safety is maintained and that the transport system is not otherwise negatively affected in terms of restricting traffic flow and accessibility for other road users. The draft regulations are deemed to have a positive effect on the vehicle combinations' stability, starting ability on slippery roads and need for space in the infrastructure.

The regulations will, as far as possible, be designed in a way that makes them easy to understand and makes it is easy to check compliance with the rules for those concerned, such as drivers, the police, hauliers and vehicle manufacturers.

Consequential changes:

The Swedish Road Administration's regulations (VVFS 2005:131) on the maximum speed for vehicles with two trailers (double combination) are to be repealed and replaced by new Swedish Transport Agency regulations (TSFS). In addition, a new condition for applying the derogation is proposed, stipulating that the length of the vehicle combination shall be no more than 25.25 metres. Furthermore, the requirement stipulating that bodywork and chassis must not come into contact with each other when turning with a full wheel lock is proposed to be removed. In addition, certain linguistic and editorial changes are to be made.

The impact assessment has been amended after consultation. Changes are marked by a line in the margin.

Introduction

The impact assessment is divided into two chapters. The first chapter deals with draft regulations laying down technical requirements for vehicle combinations exceeding 25.25 metres but not 34.5 metres when they operate on the road network that the Swedish Transport Administration and municipal road operators under Chapter 4, Section 17f of the Road Traffic Ordinance (1998:1276) allocate for these longer vehicle combinations.

The draft allows the use of three additional vehicle combinations: B-double, C-double and Nordic combination. A B-double combination consists of a tractor unit, link semi-trailer, and lastly, a semi-trailer. A C-double combination consists of a truck with two attached centre-axle trailers, and a Nordic combination consists of a truck with an attached dolly and semi-trailer. Both B-double combinations and Nordic combinations are common today, but with a maximum length limit for the combinations of 25.25 metres. These new variants of the combinations make use of the maximum permissible length, in accordance with Chapter 4, Section 17f of the Road Traffic Ordinance, for each vehicle forming part of the combination. This means that the total length of the vehicle combinations will be around 27 metres.

The second chapter contains consequential amendments deemed necessary to avoid double regulation as regards the maximum speed of vehicle combinations longer than 25.25 metres.

Background

A government decision in August 2022 introduced a new provision in the Road Traffic Ordinance, namely Chapter 4, Section 17f, on 31 August 2023. The provision authorised the Swedish Transport Administration and municipal road operators to lay down that, on a given road, part of a road or section of road, the length of a vehicle combination may not exceed 34.5 metres. The provision also contains eight conditions that must be met by the vehicle combinations. The first seven conditions contain certain dimensions and distances with respect to the vehicles forming part of the combination. The dimensions are linked to the European Modular System (EMS). The eighth condition is that the vehicle or vehicle combination meets the requirements for design and equipment laid down by the Swedish Transport Agency.

The decision to include the provision in the Road Traffic Ordinance was based, among other things, on the assignment[1] given to the Swedish Transport Administration by the government in 2018. The assignment was

[1] Assignment to analyse whether and where longer lorries should be allowed on the Swedish road network. N2018/04593/MRT

to analyse whether and where longer lorries could be allowed on the Swedish road network in order to increase the transport efficiency and reduce the climate impact of freight transport. The final report for the assignment was presented to the Government Offices in March 2019.

Within the framework of the assignment, the Swedish Transport Administration investigated the conditions for operating longer vehicle combinations on the Swedish road network, identified the roads on which longer vehicle combinations should be allowed and analysed the consequences of such an allocation. In order to assess the consequences that introducing longer vehicle combinations on the proposed road network would have, the Swedish Transport Administration carried out a quantitative analysis of the socio-economic effects. A qualitative assessment of impacts, transport policy achievement and distributional effects was also carried out for the period 2018-2058. The impact assessment is based on the assumption of a continued allocation of the road network for use by lorries up to 74 tonnes, irrespective of whether longer lorries are allowed or not. The quantitative analysis shows a societal benefit between approximately SEK 9.5 billion and SEK 14 billion over the period.

In order for the benefits of longer vehicle combinations to be exploited, the Swedish Transport Administration highlights a number of conditions that must be fulfilled. According to the Swedish Transport Administration, the assumptions regarding vehicle characteristics and design of infrastructure should be met in order to ensure that accessibility, traffic flow and road safety are maintained. Furthermore, compliance needs to be ensured and transportation should be able to reach the starting and destination points or other appropriate transhipment points. In addition, sufficient diversion routes should be in place to ensure redundancy and minimise disruption during incidents. Finally, the pace and scale of the allocation should be transparent so the business sector can adjust to, and benefit from, the new conditions without excessive commercial risks.

Overall, the Swedish Transport Administration’s analysis shows that there are major societal benefits in allowing longer vehicle combinations. However, they emphasise that this is conditional on both the infrastructure as well as the vehicles and vehicle combinations meeting certain assumptions regarding functionality and characteristics. These assumptions include that the vehicle combinations should have characteristics regarding the vehicle combinations’ space requirements, starting ability and stability, corresponding to today’s 25.25 metre long vehicle combinations.

Analysis of simulated lane change manoeuvres involving vehicle combinations that are 25.25 metres long, consisting of a truck and dolly

with attached semi-trailer, shows that these have a rearward amplification just below 2.0 and a damping coefficient of just over 0.3.

For 25.25-metre long vehicle combinations, the current requirement is that they must meet the turning radius requirement in the Swedish Transport Agency's regulations (TSFS 2012:126) on turning radius requirements for vehicle combinations exceeding 24.0 metres in length and equipment requirements for vehicles included in such vehicle combinations. The requirement is that the vehicle combination should be able to turn within a circle with an outer radius of 12.50 metres and an inner of 2.00 metres. No part of the vehicle combination or load shall sweep outside or inside the circles during the turn.

On the basis of the authorisation provided for in Chapter 4, Section 17f of the Road Traffic Ordinance, the Swedish Transport Agency intends to issue regulations setting out technical requirements for these longer vehicle combinations.

Definitions and concepts

The terms used in this impact assessment have the same meaning as in the Road Traffic Definitions Act (2001:559). In addition to these, the following terms are also used.

Term	Explanation
A-double combination	vehicle combination consisting of a *tractor unit* coupled to a semi-trailer and a dolly with an attached semi-trailer;
AB-double combination	vehicle combination consisting of a truck coupled to a dolly with an attached *link semi-trailer*, which, in turn, is coupled to a semi-trailer;
actively steered axle	steering axle, the steering angle of which is determined by an electric or hydraulic steering unit;
B-double combination.	vehicle combination consisting of a *tractor unit* coupled to a *link semi-trailer* which, in turn, is coupled to a semi-trailer, where the distance between the front coupling device of the link semi-trailer and the rear edge does not exceed 12.0 metres;
C-double combination	vehicle combination consisting of a truck coupled to two centre-axle trailers;
tractor unit	truck without a load compartment, equipped with a coupling device (fifth wheel) for a semi-trailer;
link semi-trailer	semi-trailer with a rear fifth wheel for coupling to another semi-trailer;
self-tracking axle	steering axle, the steering angle of which is determined by the cornering forces caused by tyre-road adhesion;
Nordic combination	vehicle combination consisting of a truck coupled to a dolly with an attached semi-trailer;
performance value	value determined by the manufacturer, indicating the load a vehicle and its coupling device can withstand;

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A. General

1. What is the problem or the reason for the regulation?

The reason for the regulation is to enable more types of vehicle combinations that are longer than 25.25 metres to be used on the particular road network that the Swedish Transport Administration and municipal road operators have issued regulations on. At the same time, the aim of the regulations is to reduce the risk that these longer vehicle combinations will create problems in traffic and have a negative impact on road safety on the road network road operators allocate for the vehicle combinations.

The characteristics of vehicles and vehicle combinations that are particularly important in order to ensure that road safety and traffic flow are not adversely affected are their stability and starting ability, especially in winter conditions, as well as their need for space.

The need for space reflects the ability of the vehicle combinations to travel on smaller roads with small roundabouts, junctions or turning points. Since the road network, which municipal road operators in particular will have to allocate, also consists of smaller roads and streets with small roundabouts and intersections, a relatively strict requirement is set that these longer vehicle combinations do not take up more space than already existing vehicle combinations with a maximum length of 25.25 metres.

The starting ability of the vehicle combinations concerns their capacity to start and move off from a standstill and their ability to manage inclines in slippery conditions. Stability in this case concerns the directional stability of the vehicle combinations.

In some cases, technical requirements that have a positive effect on, for example, stability may have a negative effect on, for example, the need for space. We have taken this into account and weighed the various aspects against each other in order to find compromises that, as far as possible, enable vehicles and vehicle combinations to reach a sufficiently high level of stability, space needs and starting ability.

1.1 Stability

The longer permitted vehicle combination length means that additional trailers can be connected to a vehicle combination compared to the vehicle combinations in use today. For each attached trailer, the lateral movement of the vehicle combination is amplified. This amplification of the lateral

movement is called rearward amplification and means that the lateral movement of the lorry is amplified by the attached trailers. The rearward amplification is also speed dependent and increases with increased speed. A large rearward amplification means that the trailers move much more than the lorry laterally, for example during a lane change.

With more trailers attached together, the rearward amplification becomes larger, making these longer vehicle combinations more unstable. They can thus pose a major risk to road safety and may also be perceived by other road users as wobbling more on the road.

When the vehicle combination is changing lanes, it is important that, in addition to the manoeuvre not being amplified too much by the trailers, the lateral movements are also dampened as quickly as possible. Otherwise, the trailers will continue to sway sideways across the road, thus posing a major safety risk. The rate at which these lateral movements are damped can be expressed as the damping coefficient of the vehicle combination. A high damping coefficient means that the lateral movements of the trailers are damped quickly.

A vehicle combination with high rearward amplification and a low damping coefficient is more unstable than one with low rearward amplification and a high damping coefficient.

1.2 Need for space

When more vehicles are coupled together, the need for space is generally also greater, which may limit the roads and streets that can be allocated for use by these longer vehicle combinations. It is, above all, the municipal road and street network, whose street layout will likely pose the greatest challenges to allow traffic taking into consideration the vehicle combinations’ space needs.

1.3 Starting ability

Winter road conditions pose a higher risk of accidents and greater problems concerning free-flowing operation for heavy vehicles. Stoppages in traffic caused by stationary vehicles that cannot travel uphill, for example, cost society money. This cost is difficult to calculate because a standstill does not automatically involve the emergency services or recovery services. Although such standstills are in many cases relatively short, they can still entail costs in terms of restricted traffic flow and accessibility. Stationary vehicles also pose an increased risk of accidents because road users realise too late and do not have time to stop or make a safe evasive manoeuvre.

Due to the fact that the weight distribution of these longer vehicle combinations will shift more towards the axles of the trailers, the truck will

bear a smaller proportion of the load weight. This means there is a risk that these longer vehicle combinations will have worse starting ability in slippery road conditions than the vehicle combinations of today. In order to improve the opportunities for the driver to handle the vehicles safely in winter conditions, it is important to ensure that the friction between the tyres and the road surface is as high as possible.

Tyre-road friction is affected by the design of the tyres, whether they are suitable for winter conditions or not, and by the pressure of the tyres against the road surface.

Lorries with only two axles are, generally speaking, less able to operate in winter conditions than lorries with three or more axles. A two-axle lorry, among other things, does not have the possibility to lift an axle in the bogie and thereby temporarily increase the pressure between the tyres on the drive axle and the road. The weight of the extra axle on a three-axle truck, approximately one tonne, also means that these have a higher drive axle pressure when driving unladen with one axle raised than two-axle tractor units.

Even for trucks with three or more axles, with or without tandem drive, it can be a challenge to achieve a sufficiently high drive axle pressure when the vehicle combination gets longer. With more vehicles in the vehicle combination, there are, in general, more axles to distribute the weight over while more axles mean increased rolling resistance. This affects the starting ability of the vehicle combination when travelling with little or no load. For this reason, it is of great importance that the vehicles are designed in such a way that the weight distribution of the vehicles helps to increase the lorry’s drive axle pressure, and thus its propulsion capacity.

2. What is to be achieved?

By issuing regulations with clear requirements for equipment and design that will apply in order to be allowed to drive a vehicle combination exceeding 25.25 metres but not 34.5 metres, the risk is reduced that road safety and traffic flow will be adversely affected.

The requirements are primarily formulated as requirements on the design and equipment of the vehicles and aim to ensure that the stability and starting ability of the vehicles is sufficient and that the space required is not greater than the allocated road network allows. In addition, the braking performance and coupling devices of the vehicle combination shall be adequately dimensioned.

The requirements are specified in the regulations, clearly stipulating the requirements and conditions to be met in order to be allowed to drive these

longer vehicle combinations. The requirements are based on the transport policy goals for accessibility and safety of the transport system and aim to contribute to the sustainable development of freight transport by road within Sweden.

Particular attention paid when drafting the requirements

When drawing up the regulations, particular attention has been paid to the fact that the last semi-trailer in two of the proposed vehicle combinations, the Nordic combination and the B-double combination, must be those already used today in vehicle combinations with a maximum length of 25.25 metres. These semi-trailers can thus continue to be used in intermodal transport, for example by rail.

In addition, great emphasis has also been placed on that, as far as possible, it should not be necessary to convert lorries; instead, lorries that meet certain approval requirements should be able to be used in these longer vehicle combinations.

Particular attention has also been paid to the regulatory framework adopted by our Nordic neighbours regarding vehicle combinations over 25.25 metres in length, in order to avoid conflicting rules in different countries, thus enabling cross-border traffic even though the national rules in each country are not exactly identical.

3. What are the alternative solutions?

3.1 Impact if nothing is done?

Intensive work is underway across Europe to reduce fuel consumption and emissions. The development of vehicle combinations with higher capacity than today contributes significantly to increasing transport efficiency. Since the need for freight transport is expected to increase,[2] an increase in the maximum length of vehicle combinations on roads that are not private has been seen to be necessary by the government in order to reduce the environmental impact of the transport sector. If the Swedish Transport Agency does not issue further regulations, this would mean that only the two types of vehicle combinations over 25.25 metres in length for which the Swedish Transport Agency has issued regulations through the Swedish Transport Agency's regulations and general advice (TSFS 2023:42) on technical requirements for vehicle combinations over 25.25 metres in length, may operate on the roads allocated by the road operators.

[2] Trafikanalys, 'Godstransporter i Sverige – en nulägesanalys (Freight transport in Sweden – analysis of current situation) (Report 2016:7)', 2016.

3.2 Alternatives that do not involve regulation

Under the current regulations, operation of vehicle combination types other than the two adopted in the Swedish Transport Agency's regulations and general advice on technical requirements for vehicle combinations over 25.25 metres in length is not permitted.

This means that there are no options that do not involve regulation.

3.3 Regulatory draft – design-based requirements

Self-tracking/actively steered axles

The Swedish Transport Agency is proposing that the last axle of the front link semi-trailer in a B-double combination must be self-tracking or actively steered at speeds of up to 30 km/h. The axle may be self-tracking or actively steered at speeds of up to 40 km/h.

Distance between coupling devices and axle/axle group

The Swedish Transport Agency is proposing that the distance between the coupling pin and the first axle of the rear semi-trailer in a B-double combination must be at least 6.2 metres.

For the C-double combination, it is being proposed that the truck's shackle coupling must be located no more than 0.8 metres from the last axle, and the shackle coupling of the front centre-axle trailer must be located no more than 2.1 metres from the centre of the axle group, and the drawbar on the centre-axle trailers must be at least 6.6 metres long.

The requirements for the location of the shackle couplings are necessary for the stability of the C-double combination. However, the requirement means that a truck that meets the requirement for the location of the shackle coupling for a C-double combination is not suitable for use in an AB-double combination. This is because the AB-double combination takes up too much space if the shackle coupling is too close to the rear axle of the truck.

The Swedish Transport Agency is therefore proposing that the distance between the centre of the shackle coupling and the rear edge of the truck in an AB-double combination must not be greater than 0.8 metres.

Retractable axle

The Swedish Transport Agency is proposing that the first axle of the front link semi-trailer in a B-double combination must be retractable, if the distance between the coupling pin and the first axle is less than 7.0 metres. The axle shall be capable of being raised or lowered from the driver's seat while travelling.

Three-axle centre-axle trailers with twin wheels
The Swedish Transport Agency is proposing that the centre-axle trailers forming part of a C-double combination must have at least three axles and that all axles must be fitted with twin wheels.

Coupling devices
The Swedish Transport Agency is proposing that the coupling devices fitted to the vehicles must be approved in accordance with ECE Regulation 55, 01 series of amendments, or later.

We are also proposing that the performance values of the coupling devices must comply with the requirements in the Swedish Transport Agency's regulations and general advice (TSFS 2019:129) on the coupling of vehicles and trailers or at least meet the values in the draft regulations.

3.4 Regulatory option – function-based requirements

An alternative to the draft regulation is to issue function-based requirements, instead of requirements aimed at the design of vehicles. Function-based requirements provide greater flexibility and involve fewer limitations than design requirements. The Swedish Transport Agency has previously taken the decision to strive as far as possible to have function-based requirements, as such hinder the development of new solutions to a lesser extent than design requirements. However, our assessment is that if the Swedish Transport Agency should prescribe function-based requirements for vehicle combinations with a total length of more than 25.25 metres, a support system corresponding to the 'Lastbilskalkylator'[3] needs to be developed and deployed. Without such a support system, it is not possible to verify compliance with the function-based requirements. Such a support system does not exist today.

For this reason, the Swedish Transport Agency is proposing that regulations be issued according to the regulatory draft.

4. Who will be affected?

The draft regulation mainly concerns haulage companies, transport buyers, vehicle manufacturers and builders of heavy lorries and trailers, and the Swedish Police Authority. Road operators who allocate roads for use by vehicle combinations are also affected by the regulations.

5. What are the impacts of the regulation?

5.1 Companies

(x) The regulation is not deemed to significantly impact the working conditions, competitiveness or other conditions of

[3] https://lastbilskalkylator.azurewebsites.net/

companies. All consequences for companies are therefore described under 5.1.

The draft regulation only affects those who want to drive vehicle combinations longer than 25.25 metres on the roads the state and municipal road operators have allocated for 34.5-metre long vehicle combinations. Those affected by costs due to the Swedish Transport Agency's draft regulations are, therefore, the same as those that benefit from facilitating longer vehicle combinations.

During the investigation, we had consultations with the automotive and freight transport industry on how the requirements according to the proposed regulatory option would affect them with regard to increased administrative costs as well as increases in costs for purchasing and product development. There are two Swedish manufacturers of lorries, AB Volvo and Scania. They employ a total of around 150 000 people and have a turnover of approximately SEK 400 billion. The haulage industry consists of approximately 10 000 haulage companies, which together have a turnover of more than SEK 100 billion, which corresponds to approximately 4 per cent of Sweden's GDP. The industry employs more than 86 000 people.[4]

Vehicle manufacturers that wish to build vehicles that meet the requirements of the regulations and transport companies that wish to use the vehicles may experience a marginal increase in personnel costs due to, for example, training. The companies themselves are not able to provide a cost picture for such costs. It is not possible to estimate how much of these costs can be passed on to the final customer or can be absorbed by increasing market share. Overall, the draft regulation is not expected to reduce companies' profit margins, but possibly increase them by offering new products and services to customers.

The draft requirements mean that at least one of the vehicles in the vehicle combinations will need to be rebuilt or converted. This means an additional cost of approximately SEK 75 000-90 000 when compared to a new vehicle without special requirements. The decision to make such an investment in a vehicle depends to a large extent on the benefits of the investment.

Cost estimate

Requirements for design and equipment	Cost (per vehicle)
Steerable axle on semi-trailer	approx. SEK 50 000
Liftable axle on semi-trailer	approx. SEK 15-20 000

[4] Swedish Association of Road Transport Companies, http://www.akeri.se/om-oss/akerinaringen downloaded February 2016.

The draft also includes a necessary addition to the technical requirements for the AB-double combination adopted on 15 September 2023. The addition introduces a new requirement regarding the distance between the rear edge of the truck and the shackle coupling.

This means that if a new truck was ordered after the Swedish Transport Agency's regulations (TSFS 2023:42) on technical requirements for vehicle combinations over 25.25 metres in length were adopted on 1 September 2023, that truck will not be allowed to be used in an AB-double combination after the entry into force of these new regulations unless the coupling is moved backwards on the truck.

According to the Road Traffic Register, approximately 50 three-axle trucks were registered in 2024, on which the location of the coupling device does not comply with the stipulated distance between the shackle coupling and the rear edge of the truck. However, it is not possible to know whether any of these trucks were ordered after the Swedish Transport Agency's regulations on technical requirements for vehicle combinations over 25.25 metres in length were adopted for use in an AB-double combination.

5.2 Individuals

The draft regulations enable more types of vehicle combinations that are longer than 25.25 metres to be used on the road network allocated by the Swedish Transport Administration and municipal road operators for these longer vehicle combinations. At the same time, we are proposing technical requirements that vehicle combinations must meet to ensure that traffic safety and flow are not impaired.

5.3 The State, regional authorities or municipalities

The Swedish Police Authority
The Police Authority will be affected by the fact that it must be possible to check compliance with the draft requirements in the regulation during a roadside inspection by police officers or vehicle inspectors.

The Swedish Transport Administration and other municipal road operators
The draft regulation requires, among other things, stability of the vehicle combinations, which means that fewer accidents are likely to occur on roads that are allocated to long vehicle combinations. In the event of accidents, apart from the vehicles and the goods transported, the infrastructure may also be damaged. Improved stability will then result in lower repair costs for the Swedish Transport Administration and the municipal road operators.

The draft requirements also mean that these longer vehicle combinations have the space requirements at roundabouts and intersections equivalent to existing vehicle combinations, which are currently no more than 25.25

metres in length. This means that road operators should be well able to assess which roads and road networks they can allocate for these longer vehicle combinations.

The regulations do not restrict the autonomy of municipalities or regions. Each municipality is free to issue or not to issue regulations stipulating the roads and streets that are opened up for vehicle combinations over 25.25 metres in length in accordance with Chapter 4, Section 17f of the Road Traffic Ordinance.

5.4 Environment

The draft regulation does not have any direct effects or impacts on the environment. The provision in Chapter 4, Section 17f of the Road Traffic Ordinance, which authorises road operators to allocate, by means of regulations, roads for vehicle combinations with total lengths of up to 34.5 metres, is likely to have a positive impact on the environment as more goods will be able to be moved with fewer journeys. This impact assessment does not cover effects or consequences arising from that provision but is limited to the regulations proposed by the Swedish Transport Agency.

5.5 External effects

The draft regulation has positive consequences for society. Imposing requirements on these longer vehicle combinations means that the current level of requirements for road safety and free flow of traffic does not deteriorate due to the increased overall length. In the long term, this means that more vehicles will meet the new requirements compared to today's fleet, because there are financial incentives to buy and thus build and sell these vehicles. There are calculations that show that stoppages in road traffic, due to accidents and recovery work, causes lost time of approximately 2 million vehicle hours per year.[5]

The socio-economic cost of these stoppages is estimated at SEK 360 million per year. Heavy vehicles cause a disproportionately large percentage of these road traffic disruptions. Stoppages involving heavy vehicles also have greater consequences and take longer to solve. It is estimated that heavy vehicles cause 30-60 per cent of disruptions in the winter. This corresponds to a societal cost of SEK 110-220 million.

The objective of the requirements concerning free-flowing traffic in the draft regulation is to ensure that these costs are not increased.

[5] The Swedish Transport Administration, TRV 2011/22239A.

6. Summary of options considered and why the draft regulation is considered the best option

6.1 The Swedish Transport Agency's assessment

The reason for the regulation is to enable more types of vehicle combinations that are longer than 25.25 metres to be used on the particular road network that the Swedish Transport Administration and municipal road operators have issued regulations on. The regulations also aim to ensure that these vehicle combinations can be operated safely on both smaller roads with limited room for manoeuvre and in winter conditions. The draft requirements are deemed necessary in view of the risk to road safety posed by a less suitable combination of vehicles to other road users and the social cost of such a combination if it comes to a standstill and obstructs other traffic.

The draft regulation imposes requirements on the design and equipment of vehicles forming part of vehicle combinations exceeding 25.25 metres in length but not exceeding 34.5 metres. The regulations are expected to reduce the risk of vehicle combinations coming to a standstill on the road and to counteract an increase in the number of accidents. The draft regulation also applies to vehicles and vehicle combinations in international traffic and imposes the same requirements on them, which means that the risk of special regulation is minimised.

The alternative to the draft under consideration means that function-based requirements would be developed instead of design-based requirements. However, function-based requirements mean that it could be difficult for both users and control authorities to verify these. The reason is that function-based requirements imposed on vehicles or vehicle combinations cannot be checked by simple means, but require either extensive testing on the test track or access to computational models and computer simulations.

The fact that vehicle manufacturers carry out tests and verify the requirements for the vehicles before they are delivered to the customer is not sufficient, since the requirements that need to be imposed include the whole vehicle combination and not individual vehicles. The fact that trucks often change trailers several times a week, and even per day, further complicates matters for hauliers, as they would have to redo the test procedure for each new combination of vehicles.

Our assessment is that if the Swedish Transport Agency is to stipulate function-based requirements for vehicle combinations exceeding over 25.25 metres in length but not exceeding 34.5 metres, a support system corresponding to the 'Lastbilskalkylator' needs to be developed and deployed. Such a system does not exist today.

The Swedish Transport Agency therefore considers that there are no realistic alternatives to the draft regulation.

6.2 Reasons for the draft regulation

Self-tracking/actively steered axles

The starting point for the requirement has been that the vehicle combination must meet the same turning radius requirements that today's 25.25-metre long vehicle combinations must meet, in accordance with Section 2, first paragraph, of the Swedish Transport Agency's regulations (TSFS 2012:126) on turning radius requirements for vehicle combinations exceeding 24.0 metres in length and equipment requirements for vehicles forming part of such vehicle combinations. This requirement states that a vehicle combination must be able to turn within a circle ring with an outer radius of 12.50 metres and an inner radius of 2.00 metres and that no part of the vehicle combination or load may sweep outside or inside the circles during the turn.

The reason is that these longer vehicle combinations shall not require more space than today's 25.25-metre long vehicle combinations, which today must meet those turning radius requirements. By relying on the turning radius requirement, road operators can more easily assess which roads are possible for these longer vehicle combinations.

Distance between coupling devices and axle/axle group

The Swedish Transport Agency has placed great emphasis on the fact that the second semi-trailer in the combinations can constitute existing semi-trailers of standard dimensions in order for them to be used, for example, in intermodal traffic. At the same time, it is of utmost importance not to couple together extremely short semi-trailers as these make the vehicle combination unstable and pose a risk to road safety.

In order to ensure that the second semi-trailer can be a trailer with standard dimensions, but at the same time prevent the use of an extremely short semi-trailer, it is therefore proposed that the minimum spacing between the front coupling device and the first axle of the rear semi-trailer shall be at least 6.2 metres. The proposed dimension corresponds to a semi-trailer of standard dimensions.

The distance between the shackle coupling and the last axle of the vehicles forming part of a C-double combination is crucial with respect to rearward amplification and thus the stability of the entire vehicle combination. Too great a distance results in greater rearward amplification and thus an increased road safety risk.

For the AB-double combination, a requirement has been added to the draft regulations regarding the location of the shackle coupling on the truck. The reason for this is that it is very difficult for this combination to meet the space requirements imposed by the design of the infrastructure if the shackle coupling is located too close to the truck's rear axle. The new requirement ensures that the AB-double combination does not create problems on smaller roads and intersections that have been allocated.

Retractable axle

In order to further improve the starting ability on slippery roads for the B-double combination, it is being proposed that the first axle of the front link semi-trailer must be retractable if the distance between the coupling pin and the first axle is less than 7.0 metres. When the axle is in the uplift position, more of the weight of the trailer is transferred to the tractor unit, resulting in increased drive axle pressure on the tractor unit. The requirement is especially important for combinations that drive unladen or with a small load weight, as otherwise it can be difficult to obtain sufficient drive axle pressure on the tractor unit.

Three-axle centre-axle trailers with twin wheels

The requirement for three axles with twin wheels contributes to increased stability of a C-double combination by both reducing the rearward amplification of the combination and increasing the damping coefficient. A higher damping coefficient means that the lateral movements of the centre-axle trailers are damped more quickly.

Coupling device

The draft regulation contain requirements concerning performance values for coupling devices as an alternative to the provisions in the Swedish Transport Agency's regulations and general advice (TSFS 2019:129) on the coupling of vehicles and trailers. This makes it easier for the user to check whether coupling devices and vehicles meet the performance requirements.

7. What authorisation is the Agency's right to make decisions based on?

The regulations laying down technical requirements for vehicle combinations exceeding 25.25 metres in length but not exceeding 34.5 metres, are issued by virtue of the authorisation in Chapter 4, Section 17f of the Road Traffic Ordinance (1998:1276) and Chapter 8, Section 16 of the Vehicles Ordinance (2009:211).

8. Is the regulation consistent with or does it exceed the obligations arising from EU law or other international rules?

The Weights and Dimensions Directive 96/53/EC[6] applies to the maximum authorised dimensions in national and international traffic and to the maximum authorised weights in national traffic. The draft regulation contains provisions on technical vehicle requirements for vehicle combinations exceeding 25.25 metres and, therefore, has no link to the Directive.

Within the type approval process, there is a level of requirements determined on the basis of dimensions and weights that are lower than what we already permit in Sweden today. This means that, in accordance with the provisions of the Road Traffic Ordinance for travel on roads that are not private, vehicles to be included in vehicle combinations must comply with national requirements.

The draft regulation is deemed to be in accordance with EU law, but as the draft contains technical rules, it will be notified to the Commission under the Ordinance (1994:2029) on technical rules.

The regulation does not contain any provisions giving rise to notification under the Services Directive.

9. Does special consideration need to be given regarding the date of entry into force, and is there a need for special information initiatives?

There is no need for special consideration when it comes to the date of entry into force. During the course of the work, the Swedish Transport Agency has engaged in dialogue and informed both the automotive industry and the haulage industry about upcoming regulations.

The regulations are scheduled to enter into force in the second quarter of 2025.

B. Transport policy effectiveness

The overall goal of Swedish transport policy is to ensure a socio-economically efficient and long-term sustainable transport supply for citizens and businesses throughout the country. Under the overall goal, there are performance objectives and health, environment and safety (HES) objectives with a number of prioritised areas.

[6] Council Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic.

The performance objective is to create accessibility for people and goods. The design, functioning and use of the transport system shall help provide everyone with basic accessibility, with good quality and usability, as well as contribute to the development dynamic across the whole country. At the same time, the transport system must uphold the value of equality, meaning it must meet the transport needs of both men and women in equal measure.

The HES objective concerns health, environment and safety. The design, functioning and use of the transport system shall be adapted so that no one is killed or seriously injured. It shall also contribute to the overall generational goal for the environment and achieving the environmental quality goals, as well as contribute to increased health.

10. How does the regulation affect the performance objective?

The free flow of traffic in the transport system is always affected to varying degrees by transport, and this applies not least to long vehicle combinations. The draft provisions containing the technical vehicle requirements are associated with meeting the performance objective, insofar as it shall be possible to drive these longer vehicle combinations without disregarding the free flow of traffic and, thus, the accessibility of the transport system.

The draft regulation concerns the vehicle combinations that will operate on the road network allocated by the road operators. By issuing draft regulations, the reliability, safety and convenience of the transport system is expected to increase for everyone travelling on the road. Fewer stoppages in traffic contribute to increased capacity and accessibility in traffic. It also leads to improved accessibility within and between regions and contributes to strengthening both national and international competitiveness.

11. How does the regulation affect the HES objective?

The HES objective is judged to be positively affected by the draft technical requirements for these longer vehicle combinations. By requiring certain spacing between axles and coupling devices, steerable axles, electronic braking systems, etc. together with clear and verifiable provisions, the proposals are expected to contribute to ensuring that road safety does not deteriorate as a result of these vehicle combinations.

The proposal is expected, given that the Swedish Transport Administration and the municipal road operators, by means of regulations, allocate parts of the road network for long vehicle combinations, to reduce the risk of accidents in traffic and, thus, reduce the risk of death or serious injury in

accidents. By providing heavy vehicles with better conditions to travel safely, queue-related accidents and incidents are also reduced. The proposal is expected to contribute to reduced costs, both for the vehicle(s) that cause a standstill and for other vehicles and road users affected by the stoppage.

Overall, the proposal is judged to contribute to meeting the HES objectives.

C. Companies

The regulation is not deemed to significantly impact the working conditions, competitiveness or other conditions of companies. All consequences for companies are therefore described under point 5.1.

The proposed regulation imposes technical condition or equipment requirements for vehicles and vehicle combinations. This simplifies compliance checks for vehicle manufacturers, hauliers and the police.

D. Summary of impacts

Affected party	Impacts that cannot be quantified		Quantified impacts	Comments
	Advantages	**Disadvantages**	**+ / -**	
Companies	Clear technical rules for vehicles that will form part of vehicle combinations exceeding 25.25 metres in length but not 34.5 metres.	-	Investment cost of SEK 75 000-90 000 per converted vehicle.	The benefit cannot be quantified beyond what has been shown in the Swedish Transport Administration's report, which indicates a social benefit of between approximately SEK 9.5 and 14 billion (for the period 2018-2058) with longer vehicle combinations.
Citizens	Safer vehicles and vehicle combinations.	-		
The State etc.	Clear rules that are verifiable facilitate spot inspections and roadside inspection of vehicles. Provides road operators with the possibility to dimension the road network for these longer vehicle combinations.	-		
External effects	-	-		
Total				

E. Proportionality of the draft

The reason for the regulation is to enable more types of vehicle combinations that are longer than 25.25 metres to be used on the particular road network that the Swedish Transport Administration and municipal road operators have issued regulations on. The regulations also aim to ensure that these vehicle combinations can be operated safely on both smaller roads with limited room for manoeuvre and in winter conditions. The draft requirements are deemed necessary in view of the risk to road safety posed to other road users by a less suitable combination of vehicles and the cost to society that a vehicle combination could cause if it comes to a standstill on the road and obstructs other traffic.

Our assessment is that the requirements being proposed for these longer vehicle combinations are at the lowest level that must be met in order not to

adversely affect road safety or the accessibility of the transport system. Since the regulations are not binding on everyone, but only on those who choose to use vehicle combinations longer than 25.25 metres, there are good reasons to assume that these companies will see a commercial opportunity. This should mean that the costs entailed by the regulations in the form of technical development and design of vehicles are lower than the expected increase in revenue.

F. Follow-up and evaluation

The reason for the regulation is to enable more types of vehicle combinations that are longer than 25.25 metres to be used on the particular road network that the Swedish Transport Administration and municipal road operators have allocated for traffic. This means that we can expect more of these new combinations to operate on the road network than if these regulations were not issued.

It is not possible to know with certainty what effect this will have on freight traffic, transport policy objectives or road safety in general, as there are a large number of external factors and circumstances that affect these. In cases where the risk of accidents involving these types of combinations increases, there is reason to investigate the causes in more detail. In order to determine what, if anything, needs to be addressed, it is important to understand the causes, and appropriate measures require statistics on both accidents and other incidents to be collected at a level of detail that is not currently done in Sweden. This includes collecting technical data for all vehicles involved in incidents and accidents, and analysing the cause, including the sequence of events, of the incident or accident.

We believe that such an effort is not reasonable from a social cost/benefit perspective. We cannot, therefore, say today whether, or when, an evaluation can be made.

G. Consultation

There is no formal requirement for consultation. However, during the investigation we have had cooperation with representatives from manufacturers of vehicles and coupling devices, the Swedish Transport Administration, the Swedish Association of Road Transport Companies, the Swedish Confederation of Transport Enterprises and the Swedish Police Authority. We have also participated in seminars with Sweden’s municipalities and regions and engaged in dialogue with representatives of the Finnish Transport and Communications Agency, Traficom.

Chapter 2. New regulations on the maximum speed for vehicles with two trailers

A. General

1. What is the problem or the reason for the regulation?

When the Swedish Road Administration's regulations (VVFS 2005:131) on the maximum speed for vehicles with two trailers (double combination) were issued, the maximum permissible length of vehicle combinations on roads other than private roads was 24.0/25.25 metres[7]. On private roads there is no general limitation on the maximum permissible length. The Swedish Transport Agency is currently investigating the possibility of operating additional vehicle combinations that are longer than 25.25 metres. Two of these, B- and C-double combinations, will be covered by both the speed derogation provided for in the Swedish Road Administration's regulations and the speed derogation provided for in Chapter 4, Section 20, fourth paragraph of the Road Traffic Ordinance. This leads to double regulation.

VVFS 2005:131 are regulations issued by the former Swedish Road Administration and are now in the Swedish Transport Administration's Code of Statutes. Amending regulations are published in the Swedish Transport Agency's Code of Statutes, which means that there will not be a consolidated version. This makes it more difficult for those who have to apply the regulations. The Swedish Transport Agency's ambition is to gradually replace the regulations of the former Swedish Transport Safety Agency and the Swedish Road Administration by means of the Swedish Transport Agency's regulations, to the extent that they are still needed. When the rules need to be amended, the assessment is that this should be done through a new statute that repeals the old Road Administration's regulation.

Section 8 VVFS 2005:131 contains a provision relating to a manoeuvre at low speeds (below 40 km/h). As the draft regulation concerns the ability of vehicle combinations to travel at speeds exceeding 40 km/h, this provision falls outside the scope of the regulations.

Section 10 VVFS 2005:131 contains a provision stating that the provisions of these regulations do not apply to the extent that a lower speed is specified for the road. This means that if the speed of the road is limited to 50, 60, or

[7] See Chapter 4, Section 17 of the Road Traffic Ordinance (1998:1276).

70 km/h, the speed derogation in the regulations does not apply, and therefore the maximum speed is 40 km/h for the vehicle combinations applying these provisions.

2. What is to be achieved?

The aim of the draft amendment to the regulations is to make the regulations applicable only to vehicle combinations up to a maximum length of 25.25 metres, thereby preventing double regulation.

By the Swedish Transport Agency issuing new regulations, instead of merely issuing amending regulations to the Swedish Road Administration's regulations, the rules are grouped into one and the same regulatory framework. This means that it will also be possible to make consolidated versions of the regulations in the future, in the event that further amendments are adopted.

Provisions outside the scope of the regulations are being deleted.

3. What are the alternative solutions?

3.1 Impact if nothing is done?

If nothing is done, regulations VVFS 2005:131 will constitute double regulation for certain vehicle combinations that will be allowed when the Swedish Transport Agency's future regulations on vehicle combinations longer than 25.25 metres enter into force.

3.2 Alternatives that do not involve regulation

Since the regulatory framework is in the form of regulations, there is no alternative that does not involve regulation.

3.3 Regulatory alternatives

We propose that VVFS 2005:131 be repealed and replaced by new regulations in the Swedish Transport Agency's Code of Statutes. The substantive changes made are set out below.

Length limitation

We are proposing the introduction of a new Section 4, stipulating that the length of the vehicle combination must not exceed 25.25 metres for the speed derogation to apply. This limitation is imposed to avoid double regulation with the stipulated speed derogation provided in Chapter 4, Section 20 of the Road Traffic Ordinance for certain combinations.

Testing has been carried out involving vehicle combinations of more than 25.25 metres in length and operated on the basis of a special permit[8] from

[8] See Chapter 4, Section 17d of the Road Traffic Ordinance (1998:1276).

the Swedish Transport Agency. So that these combinations do not have to apply for a speed exemption, we are proposing that the length limitation in the regulations does not apply to such vehicle combinations.

Requirement for vehicles not to come into contact with each other has been removed

Section 8 of VVFS 2005:131 states that it must be possible to drive the vehicle combination in a circle with full wheel lock without the vehicles' bodywork or chassis coming into contact with each other. The provision applies when turning with full wheel lock, which means a manoeuvre at low speeds (under 40 km/h). Therefore, it is not applicable since the scope of the regulations refers to speeds above 40 km/h.

Nor is there a corresponding provision for vehicle combinations longer than 25.25 metres or for combinations covered by Chapter 4, Section 20, second paragraph, point 7 of the Road Traffic Ordinance.

In the first instance, it should be in the interest of the driver and the owner of the vehicle to ensure that vehicles in a vehicle combination cannot come into contact with each other when turning with full wheel lock.

Our proposal is to delete this provision in its entirety.

Amended provision concerning the stipulated speed for the road

Section 10 of VVFS 2005:131 states that the provisions of the regulations do not apply to the extent that a lower speed is specified for the road. As mentioned in section 1, this means that the regulations do not apply if the speed of the road is limited to 50, 60, and 70 km/h and that the maximum speed is therefore 40 km/h for the vehicle combinations operating on the basis of these regulations.

In order to enable the speed derogation in the regulations to be applied, even when the speed of the road is limited to a speed lower than 80 km/h, it is proposed that Section 10 of VVFS 2005:131 be deleted in its entirety and replaced by different wording at the end of Section 3 of the new regulations. The wording is aligned with the provision in Chapter 4, Section 20a of the Road Traffic Ordinance on the maximum speed for certain vehicle combinations on private roads that are motorways.

4. Who will be affected?

Ultimately, the driver is responsible for ensuring that the vehicle combination meets the stipulated requirements when travelling on the road.

Owners of vehicle combinations longer than 25.25 metres and currently operated on private roads are affected.

Police and vehicle inspectors are also considered to affected during the roadside inspection of vehicles and vehicle combinations.

5. What are the impacts of the regulation?

5.1 Companies

(x) The regulation is not deemed to significantly impact the working conditions, competitiveness or other conditions of companies. All consequences for companies are therefore described under 5.1.

( ) The regulation is deemed to significantly impact the working conditions, competitiveness or other conditions of companies. Therefore, the impact assessment does not contain a description under 5.1, but all the consequences for companies are described in Section C.

Regulations VVFS 2005:131 are currently applicable to vehicle combinations longer than 25.25 metres. In practice, this concerns journeys on private roads. Where vehicle combinations longer than 25.25 metres are operated on such roads, the proposed length limitation will mean that they may not be driven at speeds exceeding 40 km/h on private roads. It has emerged from communications with the National Association of Private Roads (REV) and the Transportföretagen trade association that it is difficult to assess how many are affected by a length restriction to a maximum of 25.25 metres, but that it is likely to be a limited number. REV also indicated that private road owners often have problems with high speeds on their roads, and therefore speed limits are generally welcome. Many private roads also have a design that prevents driving at high speeds. The assessment is thus made that there is fundamentally no significant need to operate vehicle combinations longer than 25.25 metres at speeds exceeding 40 km/h on private roads. If there is a need for a speed higher than 40 km/h, it is possible to apply for an exemption from the speed regulations in Chapter 4, Section 20 of the Road Traffic Ordinance. Under Chapter 13, Section 10 of the Road Traffic Ordinance, such an examination is covered by fee category 4, which means a fee of SEK 2 900, see Section 10 of the Fees Ordinance (1992:191). The fee, the time and the administrative procedure for making such an application are not considered to have any appreciable consequences for those companies.

Overall, the proposal is not expected to have any significant consequences for companies.

5.2 Individuals

The draft is not expected to have any impact on individuals.

5.3 The State, regional authorities or municipalities

Chapter 13, Section 3, point 12 states that an application for an exemption from the provisions on vehicle speed in Chapter 4, Section 20 may be granted by a county administrative board if the exemption relates to one county. If the exemption relates to more than one county, the Swedish Transport Agency may grant an exemption. If someone needs to drive a vehicle combination longer than 25.25 metres on private roads at speeds higher than 40 km/h, they need to apply for a speed exemption from the county administrative board or the Swedish Transport Agency. It is difficult to determine how many such cases there may be, but it is considered to be only a few. For this reason, the draft is not considered to have any significant consequences for the county administrative boards, the Swedish Transport Agency or other state authorities.

The draft is not considered to affect the municipalities and thus does not entail any restriction of municipal autonomy.

5.4 Environment

The draft is not expected to have any environmental impact.

5.5 External effects

The draft means that the scope of the provisions in question when they were adopted will remain unchanged. No external effects are therefore expected. The same applies to linguistic adjustments, amended references and deleted provisions.

6. Summary of options considered and why the draft regulation is considered the best option

Our assessment is that the draft will only have significant consequences if we do not implement the proposed amendments to VVFS 2005:131. For this reason, we believe that our proposal is the only alternative.

7. What authorisation is the Agency’s right to make decisions based on?

Proposed amendments are issued by virtue of Chapter 4, Section 20 of the Road Traffic Ordinance (1998:1276).

8. Is the regulation consistent with or does it exceed the obligations arising from EU law or other international rules?

There are no international rules that concern this.

The draft amendment to the regulations does not introduce any new technical requirements. For this reason, it is not considered necessary to

notify the regulations to the Commission in accordance with the Ordinance (1994:2029) on technical rules. No other notification procedure applies either.

9. Does special consideration need to be given regarding the date of entry into force, and is there a need for special information initiatives?

In order to avoid double regulation, the regulations should enter into force in conjunction with the entry into force of the proposed amendments to TSFS 2023:42.

The regulations are scheduled to enter into force in the second quarter of 2025.

A. Transport policy effectiveness

The overall goal of Swedish transport policy is to ensure a socio-economically efficient and long-term sustainable transport supply for citizens and businesses throughout the country. Under the overall goal, there are performance objectives and health, environment and safety (HES) objectives with a number of prioritised areas.

The performance objective is to create accessibility for people and goods. The design, functioning and use of the transport system shall help provide everyone with basic accessibility, with good quality and usability, as well as contribute to the development dynamic across the whole country. At the same time, the transport system must uphold the value of equality, meaning it must meet the transport needs of both men and women in equal measure.

The HES objective concerns health, environment and safety. The design, functioning and use of the transport system shall be adapted so that no one is killed or seriously injured. It shall also contribute to the overall generational goal for the environment and achieving the environmental quality goals, as well as contribute to increased health.

1. How does the regulation affect the performance objective?

The draft is not considered to affect the performance objective.

2. How does the regulation affect the HES objective?

The draft is not considered to affect the HES objective.

B. Companies

The regulation is not considered to significantly impact the working conditions, competitiveness or other conditions of companies. All the consequences for companies are described in point 5.1.

C. Summary of impacts

The assessment is that the draft will only have consequences if we do not implement the proposed changes.

E. Proportionality of the draft

Our assessment is that the draft will only have consequences if we do not implement the proposed changes. For this reason, we believe that the proposed regulation is necessary.

F. Follow-up and evaluation

The draft is based on the provisions of VVFS 2005:131 and contain essentially the same provisions as before. We therefore see no reason to specifically follow up and evaluate the proposed regulations.

G. Consultation

There is no formal requirement for consultation. During the investigation of limiting the scope of the regulations to vehicle combinations under 25.25 meters in length, we had contact with the National Association of Private Roads (REV) and the Transportföretagen trade association.