

RAPPORT

Summary of
"A direction framework for
long-term infrastructure-planning,
for the periods 2022-2033 and
2022-2036"



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Summary

The task

In June 2020, the government commissioned the Swedish Transport Administration to develop a direction framework for long-term infrastructure planning. The direction planning is the first step towards a new national plan and county plans and aims to provide a basis for the government's infrastructure bill.

The Swedish Transport Administration's task is to be in charge of the long-term infrastructure planning for road, rail, maritime traffic and aviation, as well as for the construction and operation of state roads and railways. The infrastructure throughout the country must be developed and managed so that the transport policy goals are achieved. Achieving climate targets is a key starting point for planning. A cross-traffic approach, the four-step principle and the principles of transport policy provide guidance for the direction framework.

The direction framework is based on the government's and the EU's objectives, orientations and adopted strategies and assessments of the long-term development of a number of external factors, such as economics, demography and technological development.

In the framework of the development of the direction framework, consultation has been carried out with regions and Gotland municipality, who draft county plans. The Swedish Civil Aviation Authority and the Swedish Maritime Administration have, like the regions, been offered an opportunity to submit documentation and references to their documentation are found in the report.

The population and the economy growing and driving transport demand

From 2017 to 2040, the population is expected to increase by 16 percent, and real income per capita is expected to increase by 41 percent. This is estimated to lead to an increase of around 10 per cent in travel per person, which, together with the increase in population results in a 25-30 percent increase of passenger transport. During the period, domestic goods production and exports and imports of goods are expected to increase by around 50 percent, which will lead to an approximately corresponding increase in domestic transport. Travelling and transport is expected to increase significantly with all modes of transport. In relative terms, it is estimated that rail transport is expected to increase fastest, while road traffic is expected to increase most in absolute terms, as road traffic by far exceeds other modes of transport. The increase in traffic is expected to be the greatest in the country's most densely populated regions, but clearly greater outside rather than within urban areas. Traffic development and the distribution of traffic types are also affected by policies and infrastructure measures, but those effects are generally less significant than the effects of external factors overall.

The forecasts for traffic development are subject to various kinds of uncertainties, partly because external variables such as future population and economic development are uncertain. Technological development is also an uncertain factor. It is expected to lead to more cost- and energy-efficient, accessible transport solutions with less environmental impact, which may further spur transport demand. Meanwhile, digitisation in particular can lead to a reduced demand for certain types of transport. The overall impact of technology development on transport demand is therefore uncertain. The impact of the Covid-19 pandemic on future demand for and supply of transport is also uncertain.

The Swedish Transport Administration has carried out sensitivity analyses, where the most important uncertainty factors have been quantified to facilitate calculation of the likely range of traffic development.

The sensitivity analyses provide an uncertainty interval of around 20-40 percent increase in passenger car travel by 2040, and around 35-60 percent increase in rail travel. The main sources of uncertainty in the forecasts are demographic and economic development.

Although traffic development is uncertain in various respects, the Swedish Transport Administration believes that the conclusions and recommendations in the direction framework are robust for these uncertainties. This is mainly due to the fact that neither the need for operating and maintenance resources nor the ranking of measures and investments are significantly affected by variations in the traffic development.

Climate goals can be achieved with extensive electrification, biofuels and higher fuel prices

The climate objective of the transport sector is that emissions from domestic transport (excluding aviation) by 2030 should be 70 percent lower than in 2010, and basically zero by 2045. The assignment regarding the development of a direction framework states that the planning must be based on assumptions that facilitate the achievement of objectives in a cost-effective and sustainable manner, and taking into account other transport policy objectives and principles.

The Swedish Transport Administration's analyses indicate that it is cost-effective to achieve the climate objectives through a combination of extensive electrification, higher share of renewable fuels and higher fuel prices. This means that components from the three factors vehicles, fuel and a transport-efficient society are included.

Extensive electrification is needed to achieve a fossil-free transport sector. Electrification, however, takes time, even though the development of rechargeable vehicles is now rapid, because the fleet of vehicles is replaced relatively slowly. In order for electric vehicles to achieve a dominant market position, extensive expansion of charging infrastructure is required in the near future. Several reasons suggest that the public sector should actively take charge of initiating and coordinating this expansion, in cooperation with commercial operators.

As electrification is time-consuming, increased use of biofuels is also required. The Swedish Transport Administration's calculations show that around 70 percent more biofuels are needed than today to achieve the climate target for 2030, which is equivalent to replacing 55 percent of fossil fuels with biofuels (today this figure is 21 percent). This is the same level as in the government's recently announced proposal for an increased reduction obligation. As electrification increases, the necessary volume of biofuels decreases, reaching approximately today's volume in 2040. However, such a significant increase of Swedish consumption of biofuels in a relatively short period of time is not unproblematic, as there are question marks as to how much biofuels can be produced in a sustainable way. Assuming that the Swedish transport sector's consumption of biofuels must not be higher than today, the 2030 climate target will be achieved only by 2035, assuming otherwise similar conditions. In order to reach the 2030 target on time with such a limitation of the volume of biofuels, fuel-driven traffic would need to be reduced by approximately one third, given otherwise similar conditions. This would require an extremely sharp increase in the price of fuel compared to today's price level, perhaps a quadruple increase. The central issue for biofuels is the supply

side and the Swedish Transport Administration therefore proposes that the government ensure that a strategy is developed for the use and production of biofuels.

The Swedish Transport Administration's forecasts for traffic development also assume that road traffic growth will be dampened by higher fuel prices. By 2040, fuel prices are expected to almost double compared to today, which is expected to reduce fuel-driven traffic by around 20 percent compared to unchanged fuel prices.

Higher fuel prices affect different groups to different extents. At present, most income groups pay around the same proportion of their income in fuel taxes. However, there are major differences between urban and rural areas; rural residents pay about twice as much as urban dwellers. As new cars are increasingly electrified, the differences between different groups will increase: fuel tax expenditure of low-income earners is likely to increase compared to that of high-income earners, and the fuel tax expenditure of rural residents will increase compared to that of urban dwellers, as high-income earners and urban dwellers generally drive newer cars. In order to create acceptance of these policies, measures that compensate for the reduced availability may be needed. Such compensatory measures may be designed in various ways, and do not necessarily have to be limited to the transport system. While passenger car traffic should be essentially electrified within a couple of decades, the electrification of heavy traffic is likely to take longer. This means that increases in fuel costs will hit heavy goods traffic harder than passenger car traffic, which may be a problem for business competitiveness.

Efforts to improve alternatives to road transport often create major benefits by contributing to several transport policy objectives. Public transport, pedestrian and bicycle traffic are often surface, cost and eco-efficient ways of creating high accessibility, especially in dense urban environments, and rail transport is superior for many travel and transport needs. In addition, good accessibility by other means than a car also gives citizens without access to a car high accessibility as well. This is important, especially for children.

However, improved alternatives can only contribute to a modest extent to reducing the transport sector's climate emissions. This is mainly because road traffic is so much larger than the other modes of transport. Accordingly, even a large relative increase in another mode of traffic corresponds to a small relative reduction in road traffic. Moreover, migration effects are usually relatively small. When the volume of transport increases as a result of an improvement, the majority of the increase usually consists of newly generated transport, as opposed to migration from other modes of transport.

Maintenance requirements increase in both roads and railways

The government and parliament increased the framework for the existing national plan for the transport system by SEK 100 billion compared to the previous plan. Of these, 59 billion relate to investments, 11 billion to road maintenance and 30 billion to railway maintenance. Increased funding for maintenance has, among other things, facilitated important investments in priority transport flows, for example Södra stambanan and Västra stambanan.

The need for funding to maintain current functionality in terms of speed, bearing strength and capacity, and to resume neglected maintenance of roads and railways, exceeds the existing framework. On the road side, degradation is accelerating, and both low- and high-traffic road networks are gradually deteriorating. Overall, this leads to a gradual standard reduction in both road and railway networks. This may result in longer travel and transport times and delays.

There are several reasons for the increased needs. Both road and railway facilities are advanced in years. 63 percent of the state road network was built before 1970, and it is dimensioned for the volume of traffic prevailing at the time. Since then, both smaller and larger maintenance operations have been carried out in many places, but have been insufficient. In relation to the older parts of the road network, this is particularly noticeable as road structures and culverts are already largely worn out. In addition, traffic has intensified and transports have become heavier. From 1990 to 2015, traffic grew by 26 percent. This has created increased maintenance requirements on the roads.

The volume of the facilities has also increased. While new and more complex facilities improve the ability to handle disruptions, an increased need for maintenance is created. Furthermore, roads and tunnels that are currently built and planned often have more technologically advanced systems. For example, automated traffic management and traffic monitoring systems, fire safety and ventilation for improved air quality. This in turn means that the facility costs more to maintain.

It is more efficient to take care of what we have first

As the state of a facility deteriorates, it becomes more expensive to restore. In the long term, it is cheaper to prevent problems than to deal with urgent problems when they arise. This prevents capital destruction and, in the long term, very high reinvestment costs. The government has also stressed the importance of streamlining and optimising the use of existing infrastructure in the process of developing the direction framework.

Although major infrastructure investments will be completed in the coming decade, it is a relatively small addition compared to all the infrastructure that already exists. It is therefore most crucial to the functioning of the transport system to utilise and manage the existing infrastructure in an efficient manner.

The Swedish Transport Administration believes that the maintenance of existing infrastructure should have a very high priority, which permeates the proposals for allocating the planning framework in all reported directions. Analyses indicate that it would be socio-economically viable to invest more resources in maintenance than is done in the current plan. Based on existing financial frameworks, the Swedish Transport Administration considers that the benefit of maintaining the current functionality of the infrastructure is greater than making new investments.

Infrastructure plans are only a part of transport planning

The physical infrastructure is only a part of the transport system. The transport system also consists of the transport services provided by different operators, of the vehicles and fuels used by travellers and carriers, digital infrastructure and services and of public instruments such as taxes, regulations and legislation. In order to facilitate a transport system that is effective in the context of a sustainable society, the physical infrastructure is just one piece of the puzzle among many. It is therefore important to utilise and manage the existing infrastructure effectively. Well-designed pricing, information, traffic control, traffic management, traffic disruption management and minor fine-tuning can often create major positive accessibility, environmental and road safety effects in a relatively short time and at a relatively low cost. This is the basis of the so-called four-stage principle.

Infrastructure planning is therefore only part of a broader "transport planning", which integrates the development of the physical infrastructure with, for example, the development of pricing and regulation, digital infrastructures and services, legislation and

forms of organisation. This approach is necessary for a socio-economically efficient and long-term sustainable transport supply.

A chapter of this report is therefore devoted specifically to a relatively large number of examples of measures other than traditional physical infrastructure that have good potential to increase the efficiency and sustainability of the transport system. Most are so-called step 1 and step 2 measures. Some are promising and should be investigated further. Others are ripe for implementation, but are beyond the Swedish Transport Administration's ambit of power and control and relate to measures other than physical infrastructure.

Hard prioritisations are required in the allocation of the economic framework

The Swedish Transport Administration will analyse and present a proposal for the allocation of the economic framework for a twelve- and sixteen-year plan period, respectively, both starting in 2022. The proposed allocation will amount to SEK 622.5 billion for 12 years and SEK 830 billion for 16 years, and the agency will report on how the direction changes if the framework is increased or reduced, respectively, by 20 percent. Below, the terms *-20 percent*, *0 percent* and *+20 percent* are used for the different levels, and *12 years* and *16 years* respectively for the two planning periods.

In the assignment to develop a direction framework, the government has made a reference to the fact that the current national plan for the transport system 2018-2029¹ must be accomplished, and that new main lines for high-speed trains should be completed at the rate permitted by the economy. The government also specifies that the Swedish Transport Administration must indicate resources required for maintenance in order to maintain current functionality and resume neglected maintenance.

The Swedish Transport Administration concludes that the resources required to implement specified investment measures in accordance with the national plan in force, together with the resources for required to maintain current functionality, such as speed, bearing strength and capacity, cannot be accommodated within the total economic framework specified, except possibly within the maximum framework level (SEK 996 billion) relating to a 16-year planning period. Still, this does not include scope for any new investments in addition to those contained in the current plan. This is because the annual grant requirements for maintenance exceed the planning framework level of the current plan, but also because the costs of the specified items have increased. Costs have increased due to the fact that the objects largely require funding after the end of the planning period and that the costs of completing them have increased compared to when the plan was adopted.

Cost indices for investments and maintenance of transport infrastructure have, in the last ten years, increased significantly more than the consumer price index. Given the framework in the current plan and the list of appropriations roughly equivalent to the consumer price index (NPI/CPI-CT), the real scope for infrastructure measures has been reduced. If the difference in development of costs were to continue during the 2022-2033 planning period, given a framework of SEK 622.5 billion in 2017 prices, this could mean an erosion of the framework by an amount in the order of SEK 50 billion. The Swedish Transport

¹ National cross-traffic transport infrastructure plan for the period 2018-2029, see <https://www.regeringen.se/regeringsuppdrag/2018/06/faststallelse-av-nationell-trafikslagsovergripande-plan-for-transportinfrastrukturen-for-perioden-2018-2029/>

Administration strives to develop productivity and innovation in the industry to optimise resource management.

The Swedish Transport Administration has also chosen to report on directions where it is assumed that new main lines are fully financed in some other way or postponed. The three initial stages of new main lines in the existing plan encumbers the 12-year plan period with SEK 71 billion and the 16-year plan period with SEK 95 billion. For the direction -20 percent only one alternative is reported where the main lines are not included.

Accordingly, the Swedish Transport Administration presents the following possible ten direction alternatives:

- -20 percent, 12 and 16 years, without any parts of new main lines
- 0 percent, 12 and 16 years, with and without parts of new main lines
- + 20 percent, 12 and 16 years, with and without parts of new main lines.

Starting points for prioritisations

The common aspects for the different directions are set out below.

- Ability to maintain the facilities so that current functionality can be maintained very high priority. It is a cost-effective way to maintain good accessibility for both people and industry, and it prevents the degradation of infrastructure that may cause even higher costs in the longer term. Sufficient funds for maintenance also has positive geographical distributional effects, as it maintains accessibility across the country. In addition, it is an important prerequisite for creating redundancy in the transport system in the event of crises and disruptions.
- The minimum level of specified investments on roads and railways is the ability to complete those in progress²² (however, Ostlänken is not included in the alternatives, but main lines are). Additional specified (restricted³³ and unrestricted⁴⁴) investments, in addition to ongoing ones, are prioritised only when sufficient resources are available for maintenance and for other high priority needs (see below). Cost-effective measures to increase rail capacity and increased road safety should then be a priority. The combination of measures is crucial for the effects and effectiveness that can be achieved within a given framework.
- Maritime measures in the current national plan are considered to be both urgent and profitable and are included in full in all directions. These investments create in particular benefits for freight transport through reduced transport costs and increased capacity, and they therefore boost industry competitiveness.

² Ongoing means objects where a contract was executed with a contractor (turnkey or performance contract). For turnkey contracts the contractor's work with drafting building documents is also included. The physical start of construction, when production starts can take place later. If the object includes several measures, start of construction is considered to take place when the first measure has started. (This does not apply to minor preparatory work in the course of e.g. movement of cables).

³ Restricted means objects that either have a start of construction decision but are not ongoing or objects that are part of the Swedish Transport Administration's latest start of construction report for construction starts in 2021-2023 and expected to be subject to a government decision toward the end of 2020. In addition, objects are also part of the current plan whose accomplishment is considered restricted by the funding and Collaboration agreements prepared according to the Swedish Transport Administration's procedures regarding, for example, transport policy effectiveness and distribution of responsibilities between the government and other players. For specified investments with funding in the national plan the Riksdag must approve the form of funding in connection with the processing of the Budget Bill.

⁴ Unrestricted means other specified objects included in the current plan.

- Fine-tuning and environmental measures (<SEK 100 million) are considered important for the Swedish Transport Administration's ability to improve the transport system in a flexible and cost-effective way. To the extent possible, such measures must not be less than: levels in the current national plan, but should preferably increase. Fine-tuning measures are often highly cost-effective as they allow for existing infrastructure to be better used and achieve higher capacity and robustness. This creates positive effects for both passenger and freight transport throughout the country. Some fine-tuning measures aim to improve bicycle, pedestrian and public transport. This contributes to increased active mobility, which has positive health effects. Many major and minor effective traffic safety measures are also included. Targeted environmental measures include, among others biodiversity, cultural environment, noise reduction and water protection. These are necessary to achieve several of the environmental targets.
- The Swedish Transport Administration has identified increased needs for information security, robustness and emergency preparedness, entailing a new high priority item in relation to the current national plan of just under SEK 1 billion per year.
- In all areas, the Swedish Transport Administration has allowed scope for the introduction of ERTMS, entailing increased costs compared to the current national plan. ERTMS is a necessary investment to replace the current obsolete signal system. All directions also include a number of other necessary ongoing railway upgrades and modernisations, such as improved power supply and a new traffic management system.
- The Swedish Transport Administration believes that the county plans should remain a priority, since there are major needs within the part of the transport system that the drafters of county plans are in charge of. These include, for example, measures to improve road safety, pedestrian, bicycle and public transport and state co-funding for municipal infrastructure measures. Annual appropriations for the county plans⁵ are based on the current level and increase and decrease, respectively, by 20 percent pro rata to the total planning framework.
- Through the urban environmental agreements, the Swedish Transport Administration and the municipalities cooperate in relation to improvements of innovative and surface-efficient improvements in urban transport systems. Since both municipalities and the Swedish Transport Administration jointly prioritise between projects, there is a high likelihood that cost-effective measures will be selected, even if the Swedish Transport Administration does not yet have a basis for assessing the overall cost efficiency of urban environmental agreements. In order to achieve the intended effects on municipal planning through the urban environmental agreements, it is important that the investment is long-term. Urban environmental agreements are therefore included in all directions at the current plan level, and increase or decrease, respectively, by 20 percent pro rata to the overall planning framework.
- Annual resources for research and innovation, planning, support and exercise of public powers are proposed to at least remain at current levels. Premises of interest,

⁵ Cross-traffic county plans for regional transport infrastructure.

repayment of loans and grants is determined by concluded contracts and cannot be affected.

Proposed directions

The directions can be briefly described as follows:

Direction framework level -20 percent

12 years (SEK 498 billion): There is no scope for any parts of the new main lines. There is also no scope for new specified measures, but only for ongoing specified measures. Maintenance is of a slightly higher level than in the current national plan but far from being able to maintain current functionality. There are no resources for an investment in height bearing capacity on the way to bearing capacity class four (BK4). The annual appropriations for fine-tuning, the environment, urban environmental agreements and regional plans are reduced.

16 years (SEK 664 billion): The annual appropriation for maintenance is slightly higher. In other respects the same applies as for the *12-year planning period*.

Direction framework level 0 percent with parts of new main lines

12 years (SEK 622.5 billion): There is some scope for the initial stages of new main lines, but not sufficient for the rate of expansion required by the current national plan. There is no scope for new specified measures, but only for ongoing specified measures. Maintenance is of a slightly lower level (about 93 percent) than required to maintain current functionality. There is scope for BK4 according to the current national plan. Funding for fine-tuning, environment and urban environmental agreements is reduced.

16 years (SEK 830 billion): The scope for new main lines is marginally larger than for the *0 percent 12 years option*. Ongoing and some of the restricted specified measures can be implemented within the planning period. Maintenance is of a slightly lower level (about 97 per cent) than required to maintain current functionality. There is more scope for BK4 than in the *12-year option*. The same applies as for the *12-year planning period*.

Direction framework level 0 percent without new main lines

12 years (SEK 622,5 billion): There is no scope for new main lines. There is also no scope for new specified measures, but ongoing and some restricted specified measures can be implemented within the planning period. Maintenance is sufficient to maintain current functionality. There are resources for BK4, but they do not cover the entire requirement. Annual appropriations for fine-tuning, the environment, urban environmental agreements and regional plans are the same as in the current national plan.

16 years (SEK 830 billion): Ongoing, restricted and a small part of the unrestricted specified measures can be implemented. In other respects, the same applies as for the *12-year planning period*.

Direction framework level 20 percent with parts of new main lines

12 years (SEK 747 billion): There is some scope for the initial stages of new main lines, with a rate of expansion according to the current national plan. There is no scope for new specified measures, but other ongoing and some restricted and a part of the non-restricted specified measures can be implemented within the planning period. Maintenance is sufficient to maintain current functionality. BK4 can be fully implemented. The annual appropriations for fine-tuning, the environment, urban environmental agreements and regional plans increase.

16 years (SEK 996 billion): All ongoing, restricted and unrestricted specified measures in the current national plan can be implemented within the planning period. In other respects, the same applies as for the 12 year planning period.

Direction framework level 20 percent without new main lines

12 years (SEK 747 billion): There is no scope for new main lines. New specified measures for SEK 23 billion can be implemented. All ongoing, restricted and unrestricted specified measures can also be implemented. Maintenance is sufficient to maintain current functionality. BK4 can be fully implemented. SEK 13 billion can be used to resume neglected maintenance (total need 66 billion). Annual appropriations for fine-tuning, the environment, urban environmental agreements and regional plans increase.

16 years (SEK 996 billion): New specified measures for SEK 58 billion can be implemented. SEK 15 billion can be used for neglected maintenance. In other respects, the same applies as for the 12-year planning period.

Traffic development does not significantly affect the priorities

In the Swedish Transport Administration's basic forecast, passenger transport work increases from 2017 to 2040 by 28 percent and freight transport work by 51 percent. Passenger transport by car continues to dominate and increases by 27 percent.

The Swedish Transport Administration considers that a lower growth rate for road traffic than indicated by the forecasts does not call for any major changes in the allocation of appropriations in the reported directions. Rail investment already dominates the scope for specified measures and the majority of road investments are not motivated by increased road traffic but by the fact that they improve road safety or shorten travel times. If road traffic does not continue to increase, road investments generally become less profitable and rail investments generally become somewhat more profitable. However, this does not change the fact that the road objects in the current plan are generally more socio-economically viable than rail objects.

The reported need for resources for maintenance is also not expected to be affected significantly due to a different traffic development. This is partly because a large part of the maintenance needs are independent of traffic growth and partly because traffic development in the next few years does not differ much between the forecasts.

A clarification of the requirements for maintenance and a more detailed analysis of the specified measures that should be highlighted, postponed or cancelled may be carried out within the framework of future plan revision.

The Swedish Transport Administration's overall assessments of the directions

The sustainability goals apply to society as a whole and the transport system as a whole. All parts of the transport system must act in concert in order to achieve these. This applies to all sustainability goals. The climate target can be achieved primarily through increased electrification, renewable fuels and policies that dampen traffic growth. The infrastructure is part of the transition to a sustainable society. For certain objectives such as accessibility, road safety and noise, the development of infrastructure is of particular importance.

The stated framework of SEK 622.5 billion is not sufficient to implement all the items in the current plan, given the plan's appropriations for maintenance and other areas. This is partly because several items in the current plan largely require funding after the current the end of

the current planning period and that the costs of completing them have increased compared to when the plan was adopted. At the same time, the funds in the current plan are not sufficient to maintain the functionality of existing infrastructure, so as to maintain the functionality, funds need to be reallocated from investments to maintenance compared to the current plan. All in all, this means that some of the investments in the current plan must be cancelled, postponed or otherwise financed in most directions.

In the *0 percent direction with parts of new main lines*, only ongoing investments in rail and road, ERTMS and the maritime investments in the current plan will be implemented. All other investments are postponed. The funds for maintenance are not sufficient to fully maintain the functionality of existing roads and railways. As a result, the resources will cover just over half of the cost of the three main rail stages in the current plan (53 out of SEK 95 billion).

In the *0 percent direction without new main lines*, funds are allocated to the main rail stages included in the current plan. This frees up resources so that the functionality of the existing infrastructure can be maintained and some of the other restricted investments in the current plan can be implemented. Four-fifths of the investment funds are used railway investments, in particular capacity increases, but also necessary system investments such as ERTMS. Approximately half of the positive effects of the additional investments consist of accessibility gains for passenger journeys, a quarter consist of reduced freight transport costs and a quarter of traffic safety gains. The fact that the appropriations for increased bearing strength (BK4) are increasing also contributes to the higher achievement of targets. The measures that can be implemented instead of the new main lines lead to significantly greater socio-economic benefits. Overall, they increase socio-economic benefits by more than SEK 100 billion without increasing costs. Fine-tuning and environmental measures contribute to increased target fulfilment beyond the estimated socio-economic benefit. The Swedish Transport Administration notes that this direction therefore results in a better socio-economic benefit than the direction with *0 percent and parts of new main lines*.

In the *+20 percent direction with parts of new main lines*, funds are sufficient to cover approximately three quarters of the new main line stages (SEK 71 out of SEK 95 billion). The functionality of the existing infrastructure can be maintained. The increased framework means that a larger part of the investments in the current plan can be implemented, and that more funds can be allocated to bearing capacity, fine-tuning and environmental measures. This is estimated to create significant social benefits. However, around one fifth of the other specified investments included in the current plan still cannot be accommodated. The socio-economic benefit of the additional measures compared to the direction with *0 percent and parts of new main line* is expected to be significantly higher than the socio-economic cost of increasing the framework by SEK 125 billion. Net benefits increase by more than SEK 155 billion compared to the direction with *0 percent and parts of new main lines*, and by around 40 billion compared to the direction with *0 percent without main lines*. The fact that the net benefit in the latter case increases by less than the framework increases means that socio-economic efficiency (net benefit per invested krona) is lower. This is because the negative net effects of the main line stages are not fully compensated by the net positive effects of more funds for other investment and bearing capacity, fine-tuning and environmental measures. The Swedish Transport Administration notes that this direction provides higher net benefits and higher socio-economic efficiency than the direction with *0 percent and parts of new main lines*. Compared to the direction with *0 percent without new main lines*, the net benefit is higher, but the socio-economic efficiency is lower.

In the *+20 percent direction without new main lines*, the funds are sufficient to carry out all other investments in the current plan, while more than SEK 20 billion remain for new investments, which increases the achievement of targets. Increased appropriations for increased bearing capacity (BK4) and for fine-tuning and environmental measures also contribute to the higher target fulfilment. It is also an advantage that planned investments (in addition to the main lines) in the current plan can be carried out as planned so that the benefits are realised as early as possible. The socio-economic benefits for the direction increase by approximately SEK 65 billion compared to the direction with *+20 percent and parts of new main lines* without increasing costs. Compared to *the direction with 0 percent without main lines*, the benefits increase significantly more than the costs, net benefits increase by over SEK 100 billion. The Swedish Transport Administration notes that this direction leads higher net benefits and higher socio-economic efficiency than the direction with *20 percent and new main lines*, and higher net benefit than the direction with *0 percent without new main lines* with roughly the same socio-economic efficiency.

In the direction with *-20 percent*, only ongoing investments are implemented, and the funds for maintenance, urban environmental agreements, fine-tuning and environmental measures and county plans are reduced. This significantly reduces the social benefits achieved compared to other directions, in particular because insufficient funds for maintenance cause delay and travel time losses. Benefits are also reduced because a large number of investments cannot be implemented. The Swedish Transport Administration's assessment is that this direction is therefore a less good use of society's resources than the other directions.

In the directions with a *16-year plan period*, the overall social benefits are consistently higher, simply because more benefits can be created with a longer plan period. Efficiency (benefit per invested krona) is, however, approximately the same as in the corresponding directions with a shorter plan period. For *+ 20 percent without main lines*, the overall efficiency could increase through selection of new measures with high socio-economic profitability.

However, a 16 year long plan period entails, as such, a risk, as it reduces the future freedom of action when funds are tied up far into the future. The directions with a 16-year plan period and new main line stages mean that state infrastructure funds are practically fully tied up for almost 20 years, as several of the investments that begin during the 16-year period continue even after the end of the plan period. To renounce freedom of action in this way can pose significant problems, as there is insufficient flexibility to meet needs and circumstances that are unknown today. The Swedish Transport Administration's assessment is therefore that the disadvantages and risks of a longer plan period are greater than the benefits.

The assessment is that infrastructure investments in the directions contribute to a sustainable society. Particularly important investments include road maintenance for accessibility across the country, major rail investments for accessibility and the environment, as well as a continued road safety work. For issues such as biodiversity, how well the transport system functions for different functional variations and for children, sufficient funds must be allocated, but many of these issues are decided at later stages of the planning process.

It is difficult to assess how the directions would affect gender equality. As men travel longer distances, they tend to benefit more from improved possibilities for longer work trips. In very simplified terms, it can be assumed that measures designed to contribute to regional enlargement are assumed to have a slightly negative effect on gender equality, while

measures in safe environments and local travel in general can be assumed to contribute more positively.

For rural areas, the proposal to increase appropriations for maintenance is particularly important as it facilitates maintenance of a good standard of infrastructure even in areas where traffic is not so extensive. Although capacity is usually sufficient in rural areas, there are sometimes reasons for smaller investments, for example, to increase road safety. In those areas where the scope for both specified measures in addition to new main lines, and fine-tuning and environmental measures are limited, there is a high risk that urgent investments in rural areas are not realised, even if they are relatively small.

The assignment to develop a direction framework also includes describing how competence supply can be secured in order to plan and implement investments, reinvestments, and maintenance. The Swedish Transport Administration notes that there is a lack of a holistic approach to provide training opportunities and increase attractiveness in the infrastructure industry. There are also shortcomings in relation to gender equality and diversity and several of the Swedish Transport Administration's proposals are aimed at addressing these.

A financing of new main lines outside the national plan frees up scope for a more efficient progress

Tough priorities will be required in the allocation of financial frameworks. The specified financial framework for the planning period of SEK 622.5 billion is not sufficient to implement all objects in the current plan while the functionality of existing infrastructure is maintained.

Södra stambanan and Västra stambanan are national arteries for passenger and freight traffic. Today the tracks are crowded and sensitive to disturbance. On the new main lines with new routes, there will be more scope for long-distance and regional trains. At the same time, the existing main lines are relieved and capacity is freed up for more freight and commuter trains. It also creates conditions for slots for efficient maintenance on existing main lines. The Swedish Transport Administration notes that the parts of the new main lines that are included in the current plan should be managed and financed outside the ordinary plan. There are several reasons for this. Firstly, it provides a more efficient expansion at a lower cost. If the development of new main lines is carried out as a cohesive project during a shorter period of time, temporary solutions are minimised. Secondly, with a different funding that would allow a faster expansion, benefits in the form of increased capacity, relief of existing main lines and increased reliability could be realised more quickly. If the main lines are to be accommodated within the ordinary plan, the implementation time will be very long. Thirdly, it is complicated to handle such large objects within the Swedish Transport Administration's regular appropriations, since we have limited possibilities to move funds between years. Even small shifts in operation and cost lead to major consequences in relation to the ability to plan and drive other projects forward. Fourthly, the inclusion of the main lines in the ordinary plan means that many urgent measures cannot fit into the plan.

