



Proposal national plan for transport infrastructure 2022-2033

SUMMARY

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Summary

The conditions for and preparation of the proposal national plan

A plan for measures related to state-owned transport infrastructure

The national plan for infrastructure describes how state-owned infrastructure is to be maintained and developed. The plan mainly covers the areas:

- operation and maintenance of state-owned roads and railways;
- investment in state-owned roads, railways, fairways and locks;
- measures to reduce the environmental impact of infrastructure;
- support to municipalities to promote sustainable urban environments (urban environment agreements); and
- research and innovation funding.

The transport system needs pedestrian and cycle paths, roads, railways, ports and airports that interact and complement one another to meet societal needs. An intermodal perspective is fundamental to planning how we should use our infrastructure in a smarter, more efficient manner.

The basis for the Swedish Transport Administration's proposal is the Swedish Government's transport policy goals, including climate goals. According to the four-step principle in transport infrastructure planning, the primary overall priority of the Swedish Transport Administration is to maintain and develop existing infrastructure and implement measures to ensure that it can be used efficiently. The function, use and environmental impact of the transport system is also affected by a number of other factors outside the remit of the infrastructure plan, such as policy instruments, regulations and transport procurement. Infrastructure is one piece among many in the puzzle of achieving the objectives of transport policy.

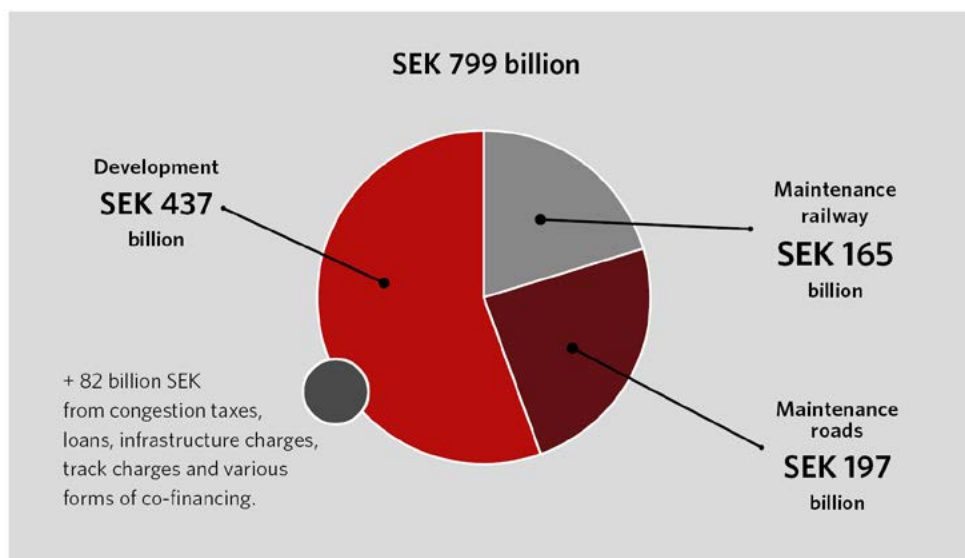
Increased financial framework for development and maintenance

The financial framework for the infrastructure plan is stated in the Government bill Infrastructure for the Future: Sustainable investment throughout Sweden (bill 2020/21:151, adopted by the Swedish Parliament based on a recommendation in report 2020/21:TU16, communicated by the Swedish Parliament to the Government 2020/21:409). Directions for this work are also included in a Government directive of 23 June 2021 to the Swedish Transport Administration to prepare a proposal for an intermodal national plan for the development of transport infrastructure for the period 2022–2033.

The planning framework for transport infrastructure measures amounts to SEK 799 billion (at 2021 price levels) for the period 2022–2033. These funds are to be distributed as follows:

- SEK 165 billion is to be set aside for operation, maintenance and renewals in state-owned railways.
- SEK 197 billion is to be set aside for the maintenance and renewals of the state-owned road network, including ensuring load-bearing capacity and frost-proofing.
- SEK 437 billion is to be used to develop the transport system. In the directive, the Government states that SEK 107 billion of this should be allocated to new high-speed rail mainlines and SEK 42 billion to county plans.¹

Compared to the infrastructure plan for 2018–2029, appropriations for the maintenance of roads and railways have increased by 13 and 25 percent respectively (expressed in fixed prices). The appropriation for the development of the transport system represents a 25 percent increase on the current plan.



¹ Proposals for county plans are prepared by regional authorities and submitted to the Government separately.



Limited scope for new investment

The Government's directive states that the current plan shall be completed, a precondition that to a large extent governs the content of this planning proposal. Any scope within the development appropriation largely covers commitments in the current plan, as many of the investments have implementation periods that extend beyond the planning period 2018–2029. If one combines the costs of the current plan over the remaining period, 2022–2029, with the costs of those objects the implementation of which extends into the next planning period, 2030–2033, and funds to unspecified items at the same level as in the current plan, this amounts to SEK 353 billion (at 2021 prices).

However, there are additional costs to be taken into account. The cost of investments in the current plan has increased since the plan was established. Assuming that a preliminary schedule for the objects in the current plan is correct, this corresponds to a cost increase of the order of SEK 80 billion during the planning period, SEK 30 billion (during the planning period) of which relates to the stages of the new mainlines included in the current plan. The Government has also stated that construction will begin of the section of the North Bothnia Line between Skellefteå and Luleå, for which the Swedish Transport Administration deems SEK 3 billion to be an appropriate level during the planning period. Furthermore, it will also be necessary to include the continued expansion of the new digital European Rail Traffic Management System (ERTMS) in the planning proposal. Given the technically optimal pace of expansion, the implementation of ERTMS should require approximately a further SEK 20 billion during the planning period in addition to SEK 18 million for the objects already included in the current plan.

The total cost of the continuation of the current plan and the additional costs amounts to SEK 460 billion over the course of the planning period, exceeding the stated financial framework for development of SEK 437 billion. The Swedish Transport Administration has therefore analysed: firstly, whether cost savings can be implemented; and secondly, whether it is feasible to postpone or divide into sections certain objects in the current plan. In the assessment of the Swedish Transport Administration, the scope for new investment in the plan over and above the continued expansion of ERTMS and the Government's preference for bringing forward the construction of the North Bothnia Line is extremely limited.

A summary of the Swedish Transport Administration's priorities and proposals

In order to accommodate the proposed plan within the stated framework, certain investments in the current plan will need to be postponed. The Swedish Transport Administration proposes that these should primarily be investments on which work has not yet started and the estimated cost of which has increased significantly since the current plan was established. In drawing up the proposal for postponements, the object's contribution to achieving transport policy goals has been the guiding principle. In the case of road investments, cost-effective measures to reduce fatalities have been prioritised. The proposal contains a total of nine postponements to investments in the current plan which would then be completed after 2033, deferring costs totalling SEK 11 billion until after the planning period. Savings and changes in scope can reduce costs by a further SEK 3 billion. It is proposed that funding for stages of the new high-speed rail mainlines be reduced from SEK 107 billion to 104 billion during the planning period, as the planning process for the Gothenburg to Borås stage has been delayed.

Due to the limited leeway in the budget, among other things, it is proposed that the expansion of ERTMS proceed at something less than the technically optimal pace, which will reduce costs during the planning period by approximately SEK 9 billion. Slowing the pace of expansion beyond what is proposed would lead to major problems, both in maintaining a robust railway network, as the existing signal system is aging and dilapidated, but also because ERTMS is a prerequisite for many planned investments.

The proposed plan also contains a limited number of new investments that we deem necessary. These includes reinforced capacity to meet the needs of the new industrial investments in the counties of Norrbotten and Västerbotten and measures to increase speeds on the East Coast Line and West Coast Line, which presuppose the expansion of the new ERTMS signalling system according to plan.

The proposed plan also involves increasing the appropriation for trimming and environmental measures by approximately SEK 5 billion, as such measures are a cost-effective way to improve the function and decrease the environmental impact of existing infrastructure. The Swedish Transport Administration also proposes that SEK 9 billion be set aside for urban environment agreements up to 2030, which we consider to be a suitable juncture at which to reassess the system and propose how it should be developed.

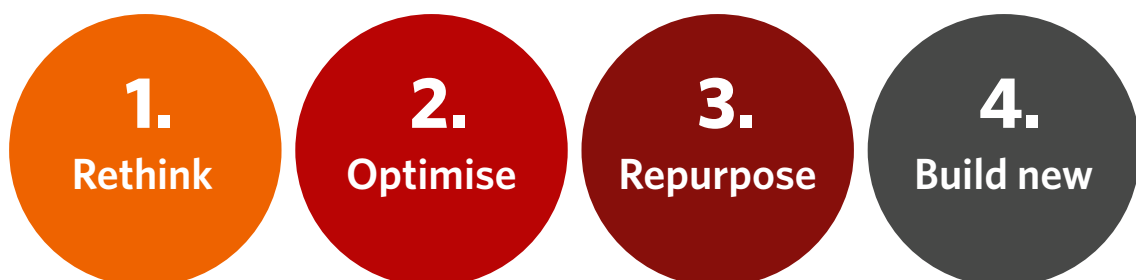
The limited scope of the development appropriation has necessarily excluded a number of cost-effective measures from inclusion in the proposed plan. The possibility cannot be ruled out that greater societal benefit could have been created within the budget if some of these had been included in the proposed plan. That said, as the Government's directive states that the current plan is to be implemented, the Swedish Transport Administration has not examined this issue in greater detail.

The four-step principle in transport infrastructure planning is fundamental to the work of the Swedish Transport Administration, the first step of which is studying whether it is possible to address an identified deficiency in the



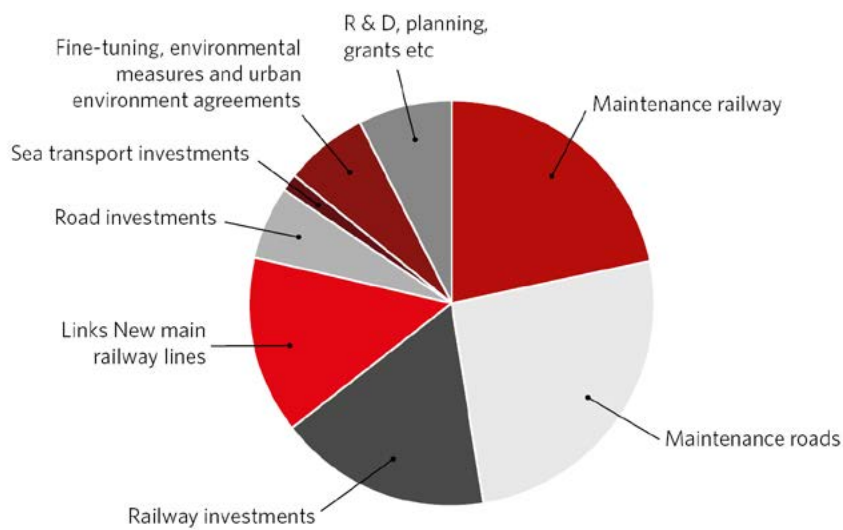
transport system by reducing or changing demand. The Swedish Transport Administration implements step 1 and step 2 measures (measures that influence demand for a mode of transport), such as traffic information, traffic management, capacity allocation and speed limits; however, as the majority of these measures do not involve physical infrastructure they are outside the remit of this planning proposal. The investments included in the current plan have already been analysed based on the four-step principle.

The four-step principle



Distribution of funds in the proposed plan

FIGURE 1 Distribution by cost item in the proposed plan.
SEK billion during the planning period.



As presented in Figure 1 almost half of the funds in the infrastructure plan are allocated to road and rail maintenance. Of the named investments (including stages of the new mainlines), which constitute almost 40 percent of the plan, just over 80 percent are rail investments, 15 percent road investments and the rest shipping investments.

Cost increases occur mainly in projects that have not yet started

The Swedish Transport Administration's named projects are part of major, complex and long-term societal development processes in which not all future events can be foreseen. These projects involve a wide range of stakeholders and perspectives. The original design and scope is liable to change as the project progresses. Societal developments may also impose changes that can be difficult to assess. It is also a matter of how the industry cost index develops and how statutory



requirements change over the course of the project. That said, technological development may lead to a reduction in costs.

As the planning process is based on placing an object in an infrastructure plan at a relatively early stage, it is difficult to avoid a situation where a given object may prove more expensive, or less beneficial, than expected. The intention is to reassess measures during the planning process as more information becomes available about its eventual cost and benefits. Problems arise, however, when cost increases arise at such a late stage of the planning process that re-examining the object in itself is associated with a substantial cost, such as when the object is a prerequisite for other objects or for urban planning. Nevertheless, the Government's directive states that the current plan is to be implemented. While the Swedish Transport Administration has examined savings and postponements to objects in the current plan, it has therefore not considered whether any such objects should be removed as part of the proposed plan.

The cost of named investments in the current plan has increased since the plan was established in May 2018. This increase mainly relates to projects that have not yet started. On average, costs associated with ongoing investments in roads and railway lines have increased by 7 percent and 12 percent respectively in relation to the current plan, which is slightly lower than the increase in the investment index. On average, costs associated with ongoing investments in railway systems (the majority of which are ERTMS objects) have increased by 38 percent since the current plan was established.

On average, the estimated cost of road and railway investments that have not yet started has increased by 50 percent since the current plan was established. The estimated cost of rail systems engineering projects that have not yet started has increased by almost 80 percent.

Some of these cost increases can be explained by changes to the scope or design of the investments. Other increases are due to more expensive intermediate goods and general increases in civil engineering costs. Finally, some increases are due to circumstances that could not have been foreseen at earlier investigative stages.





The Swedish Transport Administration works with strengthened cost control

The Swedish Transport Administration must manage central government funds responsibly, run its operations efficiently and continuously monitor the development and outcome of costs associated with ongoing and completed measures. This is reported in the Swedish Transport Administration's Annual Report, as well as on other occasions, such as start-of-construction reports. On such occasions, we also report on the reasons underlying cost changes, including changes to the scope of projects.

The Swedish Transport Administration also continuously develops its cost control and efficiency using systems, processes and procedures. This work is also conducted against the background of rapidly increasing purchasing volumes. Increased productivity is also necessary given the fact that the industry index has risen more quickly than the cost of living. There is an ongoing need to develop and review our cost control and the productivity and efficiency of the organisation. The focus of this work is on developing systematic monitoring of the causes of changes in costs. To this end, the Swedish Transport Administration has taken certain measures while working on this proposed plan.

The Swedish Transport Administration has also performed in-depth work to identify cost-reducing measures in the investment phase of new mainlines.

The Swedish Transport Administration has also decided to prioritise a number of measures over the coming year. These measures have been selected based on the Swedish Transport Administration's own analyses and experiences of planning work, observations in previous government assignments and recommendations from the Swedish National Audit Office. The measures are in the areas of:

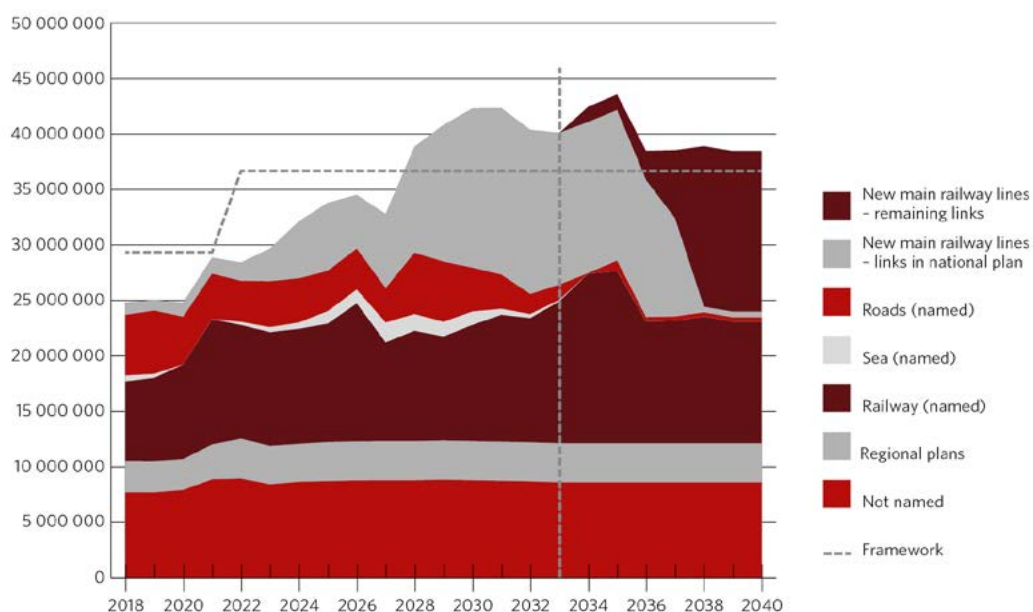
- developing safer, more efficient cost calculations in the early stages and reducing cost
- increases during the implementation phase;
- improving cost control in the early stages? by strengthening the system for deciding on changes to content and scope;
- developing working methods, governance forms and business perspectives to allow the Swedish Transport Administration to deal with changes proactively before they result in cost increases;
- improving preparations for managing changes to technical requirements, planning conditions and design issues; and
- continuing to develop productivity and innovation in the civil engineering sector, for example by implementing various types of innovation procurement in selected new-build and maintenance contracts in order to trial different business arrangements and interfaces between client and contractor, and to incentivise investment in innovative technical solutions.

The scope of future plans is limited by current commitments

The implementation period for many of the named investments in the proposed plan continues beyond the planning period, above all in the case of new high-speed rail mainlines but also the rollout of ERTMS and other railway systems engineering projects and other investments.

The diagram in Figure 2 provides some idea of the planned volume of operations within the scope of the development appropriation up to 2040, assuming that the framework for county plans and unnamed items remains the same as in the present planning proposal. Please note that the diagram does not include any additional investments in future infrastructure plans, only those in the present planning proposal and the announce continuation of the new mainlines and railway systems engineering projects. Given that investment timetables are revised on an ongoing basis, the diagram should be interpreted cautiously; however, it does offer a picture of long-term planning conditions.

FIGURE 2 Approximate distribution of cost volumes over time. SEK billion.



Significant investment volumes will run into the anticipated subsequent planning period (2026–2037). A hypothetical assumption that the framework for the development appropriation will remain unchanged would mean that the next planning period will already have a deficit of some SEK 40 billion. A significant part of these funds will be related to the new mainlines and ERTMS signal system.



We are continuing to upgrade, expand and modernise Swedish railways

We are upgrading the railways

There is a 25 percent increase in the appropriation for the maintenance of state-owned railways (SEK 40 billion during the planning period) compared to the 2018–2029 plan. Increasing resources for railway maintenance will reduce long-term maintenance and renewals costs as timely maintenance is cheaper and reduces the risk of service disruptions and speed restrictions.

Investments will continue to be made in the four designated transport corridors: the Western Mainline, Southern Mainline, northern rail freight corridor (Hallsberg–Luleå) and the Iron Ore Line (Luleå–Riksgränsen). This will reduce neglected maintenance and provide improved or unchanged robustness. During the planning period, vital measures have been implemented on the Southern and Western Mainlines. The focus will now shift to the Iron Ore Line and northern rail freight corridor. Maintenance measures and renewals will also be implemented in the 10 prioritised transport corridors of particular importance to both freight and passenger traffic.

The technical condition of lines that have less traffic will deteriorate in terms of robustness, increased risk of disruption to services and temporary speed restrictions. The functionality of these lines can be maintained by enhanced maintenance and measures to extend working life.

The roll-out of ERTMS is the single largest and most important investment. The current automatic train control (ATC) system has already exceeded its technical working life in several places and is successively approaching the end of its technical working life across the railway network. The continued introduction of ERTMS is necessary to maintaining accessibility and capacity.



The four designated transport corridors

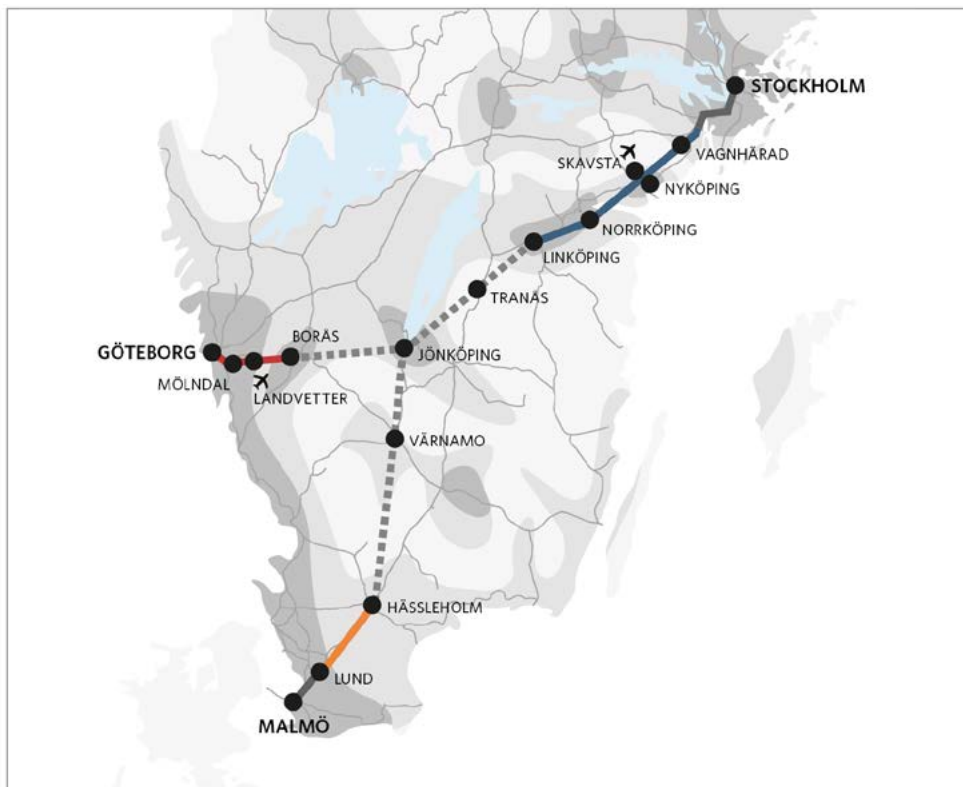
We are expanding the railways

Over 80 percent of the funds for the named investments are being made in the railway network. Almost half of these are in the first three stages of new high-speed rail mainlines and almost a quarter in railway engineering systems, including power supply measures, traffic management systems and the new digital ERTMS signal system.

In its directive, the Government stated that the Swedish Transport Administration's proposed plan should include investments of SEK 107 billion in the new mainlines during the planning period. Given the current lack of progress in the ongoing planning process for the Gothenburg–Borås stage, the Swedish Transport Administration needs to postpone parts of the implementation and reallocate funds to other objects both within and outside the new mainlines. The Swedish Transport Administration therefore proposes that SEK 104 billion be allocated to the new mainlines during the planning period.

The expansion of the new mainlines begins from metropolitan areas and the three objects that are currently in the planning stage, Järna–Linköping (the East Link), Gothenburg–Borås and Hässleholm–Lund will be the first to be completed. The East Link is being built in stages beginning in Järna in the north and continuing southward. The start of construction on the Gothenburg–Borås and Hässleholm–Lund stages is planned for 2025–2027 and 2027–2029 respectively. While the prioritisation of continued expansion must be based on a system-wide analysis, the aim is to complete the new mainlines in their entirety by around 2045. During the planning period, SEK 5 billion has been allocated to planning the central components of the system from Linköping to Borås and Hässleholm.

New main railway lines





Based on the current system design, the estimated cost of the new mainlines is SEK 325 ± 55 billion. The Swedish Transport Administration has intensified efforts to reduce investment costs and in our assessment there is significant potential for doing so by simplifying urban corridors and station design, adapting rolling stock and technical standards, land bridges, handling excavated soil and rock, and industrialisation. The goal of the Swedish Transport Administration is to reduce system-wide investment costs by SEK 65 billion compared to the estimated cost of the current system design.

According to the Government's directive, planning is to commence for the remaining section of the North Bothnia Line between Skellefteå and Luleå and planning for the North Bothnia Line as a whole is to be intensified. To this end, the Swedish Transport Administration proposes that SEK 3 billion should be allocated to the Skellefteå–Luleå section.

The current plan contains a large number of other railway investments to increase capacity on the most important routes, including the Varberg Tunnel and Ängelholm–Maria, Hallsberg–Degerön, Tomtebodavägen–Kallhäll and Värnamo–Jönköping/Nässjö. A host of smaller measures on the Central Line, Dala Line, Värmland Line, Western Mainline and Iron Ore Line will increase capacity and punctuality for passenger and freight traffic, for example through various trimming packages to increase capacity and reduce journey times. The plan also contains measures to modernise station environments and to permit longer and heavier trains.

Given the major investments in industry in the counties of Norrbotten and Västerbotten, loan-financed measures are proposed to increase capacity on the Iron Ore Line, the cost of which can partly be recouped through increased line fees. Measures are also proposed to increase speeds to 250 kmph on sections of the West Coast Line and East Coast Line, which also presupposes the expansion of ERTMS along these routes. Finally, the proposed plan contains funding for the continued planning of major renovations to Stockholm Central Station and the Tomtebodavägen terminal. These funds are vital if the Swedish Transport Administration is to participate in the ongoing planning process being conducted by the City of Stockholm and Jernhusen.

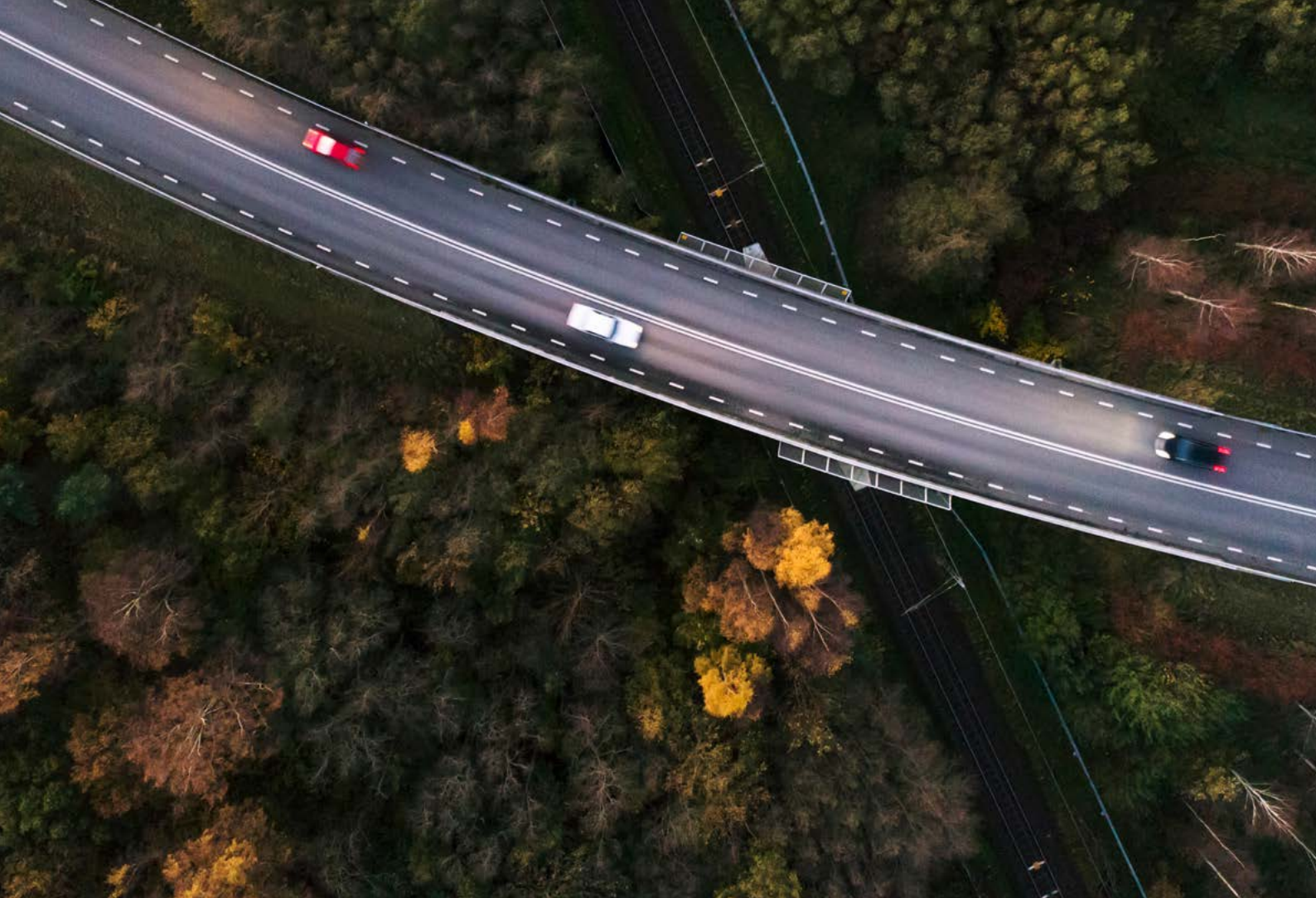
We continue to modernise the railways

The continued introduction of the new digital signalling system ERTMS is a prerequisite and a platform for modernising the railways. ERTMS is also a prerequisite for the new high-speed rail mainlines and upgrading the East Coast Line and West Coast Line to take trains travelling at 250 kmph.

Given that not all costs can be accommodated within the framework of the development appropriation, the Swedish Transport Administration proposes that the roll-out of ERTMS be slowed to somewhat less than the purely technically optimal pace. If this proposal is accepted, the roll-out of ERTMS will be completed between 2040 and 2045. If expansion is any slower, it will present major problems to maintaining the robustness of the system and incur increased costs for maintaining existing signalling systems, which are aging and expiring.

Other important modernisations include a new fibreoptic network to increase communications capacity, a national train management system, the development and administration of the Swedish Transport Administration's telecommunication facility, remote control of railways and the introduction of the Future Railway Mobile Communications System (FRMCS).





New road investments planned – major road maintenance needs remain

A limited number of road investments

Road measures account for 15 percent of funding for named investments, most of which are intended to improve road safety while simultaneously contributing to regional development through greater accessibility.

In addition to ongoing investments, the proposed plan contains two new named measures on the roads: central barriers on the E4 between Blåberget and Matfors; and the E4 Skellefteå bypass, to cope with increased traffic due to the major industrial investments in the area. Planning for Sweden's first permanent electric road between Hallsberg and Örebro will be completed.



Road safety measures

The Vision Zero interim objective for 2020 was achieved and the journey now continues towards a new interim objective for 2030. The focus of road investments is primarily installing central barriers and constructing new safer sections of road. Co-financing is also available for road safety measures on the regional road network.

Another vital area is measures to reduce the risk of injury to pedestrians and cyclists. The Swedish Transport Administration continues to improve safety on level crossings and implement measures to prevent trespass on railway lines.

There remains a significant need to implement road safety measures and the necessary measures to meet the interim objective for 2030 cannot be encompassed in the plan. The Swedish Transport Administration's proposal for new investment given an increased development appropriation is dominated by investments to increase safety on roads in rural areas. The proposal contains new objects costing in the region of SEK 14 billion, which might well have an impact on road safety of the same order of magnitude as all of the named objects in the proposed plan combined. So, some increased investment in road safety could have a significant effect.

Road maintenance needs exceed appropriated funds

There is an increase of 13 percent in the appropriation for the maintenance of state-owned roads compared to the 2018–2029 plan. The condition of the state-owned road network has been deteriorating for some time and, given the level of the appropriation, deterioration will continue to outstrip the pace of remedial measures. This being the case, despite the increase in the appropriation, the road network will deteriorate more rapidly than the Swedish Transport Administration can perform repairs.

Among other things, the increased need for repairs is due to the increasing complexity of installations, a growing need for road and bridge reconstruction

as these reach the end of their technical lifespan, increased traffic and the tendency towards heavier vehicles. Approximately 60 percent of the state-owned road network was constructed prior to 1970 and designed for the traffic of the time. Taken together, this contributes to increased wear and tear and a negative development in the condition of large parts of the road network. The Swedish Transport Administration is therefore unable to maintain the road system in a cost-effective manner as the measures implemented are neither preventive, proportional nor to the desired standard.

Both low-traffic and high-traffic roads are deteriorating, increasing the risk of restrictions being placed on the least trafficked parts of the road network. Deterioration is increasing as it has not been possible to prioritise the reconstruction of road substrata, leading to a growing need for maintenance and renewals. The condition of the substrata of low-traffic roads will deteriorate more rapidly during the planning period. The risk of increased disruption and temporary restrictions will increase on this part of the road network. The Swedish Transport Administration will ensure that roads do not deteriorate to the extent that they become impassable for light traffic.

Continued investment in load-bearing capacity will see the most important routes for heavy goods vehicles upgraded to the highest load-bearing class, BK4, as well as maintaining year-round accessibility for heavy goods vehicles. The robustness of these parts of the road network will also be improved by measures to reduce vulnerability to climate-related events such as higher water flows and increased risk of landslides. The roads on which investments are made in load-bearing capacity will therefore be robust and accessible to both heavy and light traffic.





Important investments in a convenient, green and safe transport system for citizens and businesses

Increasing opportunities to commute and travel

The measures in the proposed plan contribute to accessibility for citizens and businesses nationwide in a number of ways. Improving opportunities to commute widens the labour and housing markets, thus increasing the ability to match job vacancies with prospective employees. This will contribute to regional development, increased employment and to more people finding suitable work. Improved access to services, culture and leisure activities also contributes to regional growth and increased quality of life.

Almost 80 percent of private travel is by car, with a further 10 percent by bus. It is therefore extremely important to maintain the road network in the interests of accessibility, especially outside urban centres. While the most heavily trafficked roads have the highest priority, as these play a crucial role in linking different parts of the country, low-traffic areas of the road network shall also maintain an acceptable standard. This implies that roads must not be allowed to deteriorate to the extent that they become impassable for light traffic. It may however prove necessary to impose speed restrictions on certain sections during parts of the year, even though this will reduce accessibility. Road safety measures are also highly significant to accessibility, as they make journeys safer and more secure.

The new mainlines will eventually connect the three metropolitan areas and the towns in between, something that is especially important for business and leisure travel. Once long-distance train traffic moves onto the new mainlines, capacity will be freed up on existing lines for increased regional public transport, which will be significant for commuting.

The proposed plan contains a separate budget item for cycle paths along state-owned roads. During the planning period, the Swedish Transport Administration will be focusing on measures to create good conditions for children travelling to and from school, for commuting to work and studies and travel to other important destinations such as local service centres and leisure activities. It is proposed that part of this budget item should be allocated to co-financing purely cycling measures in county plans, both named measures and trimming measures along state-owned roads. The Swedish Transport Administration also proposes



that county planners plan and implement measures on the regional road network that contribute to more and safer cycling at least equal to the amount they receive in co-financing.

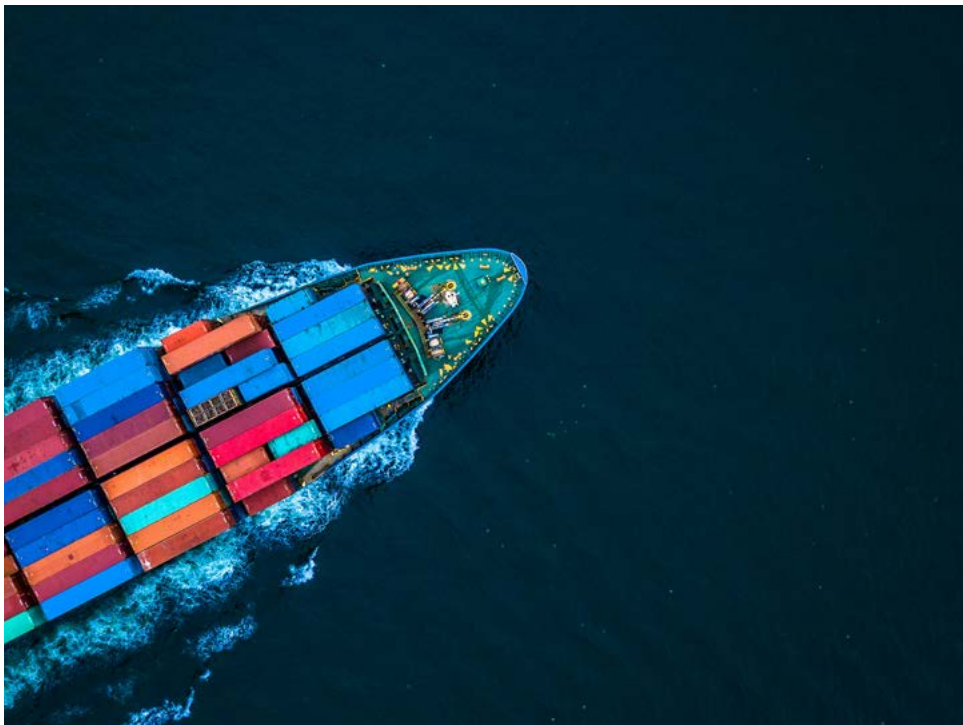
The proposed plan also contains cycling measures within the framework of metropolitan agreements and urban environment agreements. Improved cycling infrastructure is also included in a number of road investments. There is also a stated ambition to raise the standard of operation and maintenance on cycle routes where this provides significant societal benefits.

Strengthening the competitiveness of Swedish business

Maintenance investments will be made on roads and railways that play an important role for businesses, including measures to develop a road network with load-bearing capacity BK4. Measures will be implemented to enable the transfer of freight traffic from road to rail and sea, as well as measures to increase capacity on the railways. Putting longer, heavier trains into service increases access to vital rail freight routes. Given the major industrial investments being made in Norrbotten and Västerbotten, new infrastructure measures, mainly in the railway system, are proposed in these counties. The separate business budget item offers opportunities to contribute to intermodal transport solutions.

A number of important investments are being made in shipping. The fairway to the Port of Luleå is being adapted to accept larger vessels for transporting iron ore. This project involves dredging the harbour and fairway, marking the fairway, the construction of a new deep water port with associated infrastructure and new landfill. Luleå Hamn AB and LKAB are responsible for measures within the port itself. The fairway to Skandia Harbour in the Port of Gothenburg, the largest in the Nordic region, will also be dredged so that the port can continue as a call on the global route of increasingly large container vessels. Locks in Trollhättan will be replaced and upgraded and improvements will be made to the fairway between Landsort and Södertälje and, by renovating locks in Södertälje, the fairway in Lake Mälaren.

Measures to improve commuting opportunities will make it easier for businesses to find qualified labour. Particular importance will be placed on maintaining roads that are important to the hospitality industry.



Reducing local environmental impact

The plan also contains funding to reduce the environmental impact of transport and infrastructure, including a separate budget item for environmental measures along state-owned infrastructure; for example, funds for decontaminating contaminated land, wildlife crossings, combating invasive species, water protection, noise protection, natural and cultural landscapes and water.

The framework for noise and vibration facilitates the continuation of work and handling of injunctions at roughly the same pace as today. Landscape measures are focused on measures to meet statutory requirements to limit the spread of invasive species and barrier effects for and accidents involving game and reindeer. Although the framework for water measures raises the level of ambition, it still means that only a third of needs related to drinking water supply and organic water worthy of protection can be met. Measures against contamination focus on surveying, decontamination and compliance with injunctions. This area of measures also encompasses the environmental guarantee, which involves remuneration to certain central government organisations.

Socioeconomic effects

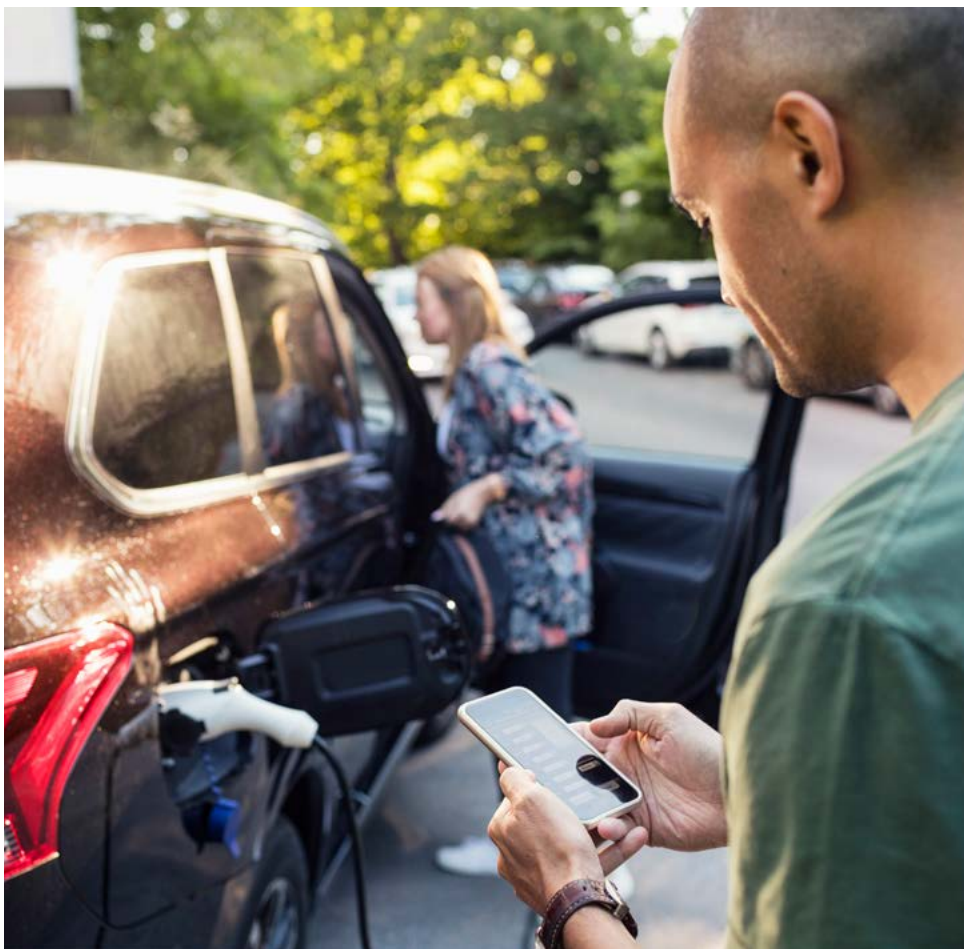
The Swedish Transport Administration's analyses show that increased appropriations for the maintenance of roads and railways are socioeconomically profitable, and that it would have been socioeconomically effective to further increase these resources. Investments in load-bearing capacity to permit heavier vehicles on roads are profitable from a socioeconomic standpoint, and it would also be socioeconomically profitable to permit longer vehicles to use certain parts of the road network, as this would reduce both the cost and environmental impact of transport.

Based on effect size calculations conducted by the Swedish Transport Administration, appropriations for trimming, traffic safety and environmental measures are deemed to be highly cost-effective. The Swedish Transport Administration therefore proposes to increase this appropriation.

Named investments have an average net present value ratio (NPVR) of – 0.3 (excluding metropolitan agreement negotiations and certain system investments the effects of which cannot be calculated); excluding the stages of the new high-speed rail mainlines, the average NPVR is 0.2. The average NPVR for railway objects is – 0.2, for road objects 0.9 and for shipping objects 0.7. The profitability of both rail and road objects is very widely spread. It has been necessary to omit a large number of highly socioeconomically profitable investments in both road and rail from the proposed plan.

The socioeconomic profitability of the stages of the new mainlines are negative, with an NPVR between – 0.8 and – 0.6. This low profitability is to some extent due to the fact the stages included in the proposed plan will not be fully in use until the entire system is completed. At current cost estimates, the NPVR for the system as a whole (including the stages in the plan) is estimated to be – 0.5. Efforts are currently underway to identify cost-cutting measures, with a stated ambition of reducing the total cost of the system by SEK 65 billion.

The overall aim of socioeconomically efficient transport supply is not simply a matter of investing in infrastructure, it is also a matter of using the transport system efficiently. Among other things, this requires policy instruments that internalise the external effects of emissions, accidents and noise, as well as the efficient provision of public transport services, such as regional public transport. This is, however, beyond the scope of the national plan for infrastructure.



New technology and digitisation provide the conditions for developing a modern and sustainable transport system

The Swedish Transport Administration contributes to technological advancement and implements the possibilities of digitisation, which develops the design, maintenance and use of the transport system. As the amount of available data and information increases, new services are created in the various components of the transport system. Digitisation facilitates new types of measures and decision-making support based on interaction between vehicles and infrastructure to create benefits. During the planning period, by giving due consideration to the development of data sets and digital infrastructure, both within the framework of its own organisations and in collaboration with other stakeholders, the Swedish Transport Administration will work to ensure that full advantage is taken of the opportunities afforded by digitisation. New types of methods with distinct elements of digitisation, that provide direct effects in the transport system, can facilitate the transition to a sustainable transport system.

The following are areas of priority for research and innovation: productivity; climate impact; efficient, inclusive transport systems; and digitisation of the transport system for a sustainable society.

One important element of the transition to a fossil-free transport system is the electrification of road traffic. Planning for Sweden's first permanent electric road between Hallsberg and Örebro is nearing completion and the road is expected to be operational around New Year 2026.

Our most powerful climate policy tools are beyond the scope of the national plan for infrastructure

The transport sector's climate goal is that by 2030, emissions from domestic transport (excluding aviation) shall be reduced by 70 percent compared to 2010, with zero net emissions by 2045. The vast majority of Sweden's domestic carbon dioxide emissions from transport, approximately 93 percent (2017), come from road traffic. As road traffic constitutes around 85 percent of passenger transport work and 50 percent of freight transport work, the inescapable conclusion is that the main way to achieve climate goals is to make road traffic fossil-free. Electricity must be the dominant means of operation with a couple of decades, mainly through battery operation but also fuel cells. Those fossil-fuel vehicles that are still sold must also be more efficient. Over the coming decades, given that it will take time to phase out fuel vehicles, we will also need to increase the use of biofuels if we are to achieve the interim goal for 2030. All of this demands various types of policy instrument as well as an exponential expansion of charging infrastructure. That said, the most important tools – policy instruments, regulations and charging infrastructure – are beyond the scope of this planning proposal, which mainly deals with the maintenance of and investment in road and rail infrastructure.

In addition to the transition to fossil-free fuels, the transport sector's greenhouse gas emissions can be cut by reducing the number of vehicles on the roads, something that will also reduce congestion, accidents, noise and other types of emissions. In the proposed plan, approximately 85 percent of funding for named investments goes to rail and shipping investments. The Swedish Transport Administration will also fund many measures to promote cycling and public transport. Such investments and measures can create a great many benefits for society by increasing accessibility for citizens and businesses without increasing greenhouse gas emissions. To some extent, this will also contribute to reducing road traffic and increasing the efficacy and acceptance of measures that make road transport less attractive, such as raising fuel taxes and reducing speed limits. The extensive infrastructure investments contained in the proposed plan will have very little effect on passenger and goods transport. According to preliminary calculations, the rail investments will reduce road transport by a total of one quarter of a per cent, while road investments will increase traffic by roughly the same amount. That the effects of transport work in total are so limited is partly due to the fact that road traffic accounts for a much larger percentage of passenger and goods transport than other modes of transport, so that even a large increase in other modes will equate to a relatively minor reduction in road traffic, partly because the substitution effect between modes of transport is relatively small. When transport volumes increase due to an improvement – for example, the expansion of alternatives to road transport – the majority of the increase will be newly generated traffic rather than a transfer from the roads.



The proposed plan contributes to and conforms with climate goals

While priorities are influenced by the ambition to transfer transport from roads to railways and shipping, they are also indirectly influenced by assumptions in analyses and traffic forecasts about policy instruments that reduce road traffic and transfer some of it to rail and shipping. According to the Government's directive, planning should be based on "a scenario that includes already adopted and announced policy instruments and measures within the transport sector". The Swedish Transport Administration's forecasts and calculations therefore include assumptions about future increases in fuel taxes and emission reduction obligations that together will result in an approximate doubling (in fixed prices) of fuel prices by the forecast year 2040. The forecast also assumes that measures will be taken to halt the increase in car ownership, and instead ownership declines somewhat. These assumptions contribute to curbing the increase in road traffic and increasing rail traffic more rapidly, increasing the market share of the railways compared to the present. This will make railway investments more profitable and road investments less so in comparison to a scenario in which these assumptions are not made.

The proposed plan can therefore be said to contribute to and conform with the climate goals. It contributes to fulfilling the climate goals in as much as an overwhelming proportion of investments are in the railways, and it conforms with the climate goals in that planning has been based on a scenario in which policy instruments to curb road traffic and steer towards electrification are assumed to have been put in place in the future, and that the road investments included in the plan are motivated even if there is zero growth in traffic.



