

1 Non-technical executive summary intelligible to the general reader

1.1 Introduction and fundamentals of SEA

Preparation of the FTIP 2030 involves carrying out a Strategic Environmental Assessment (SEA), which takes environmental concerns into account at an early stage. The Environmental Report is part of the SEA and constitutes the basis for participation of the authorities and the public within the meaning of section 14h ff. of the Environmental Impact Assessment Act. The present main body of the Environmental Report is supplemented by the environment-related project dossiers in the FTIP Project Information System (PRINS). They can be downloaded from the Internet at www.bvwp2030.de.

The purpose of the SEA is to identify, describe and appraise the major environmental effects of the FTIP. Official decisions regarding the Plan must pay due regard to the outcome of the appraisal of the environmental effects. They must consider the direct and indirect effects of the FTIP on the assets listed in section 2(1) of the Environmental Impact Assessment Act:

- human beings, including human health, fauna, flora and biodiversity;
- soil, water, air, climate and the landscape;
- the cultural heritage and other material assets; and
- interactions between the assets listed above.

When taking environmental concerns into account at an early stage, reasonable alternatives must also be considered. At the level of federal transport infrastructure planning, these may be alternative transport networks and alternative modes of transport.

The key SEA document is the present Environmental Report, prepared in accordance with section 14g of the Environmental Impact Assessment Act. It contains the environmentally relevant information that can be obtained without excessive effort and takes into account current knowledge, generally recognized methods of assessment, the contents and degree of detail of the FTIP and its status in the decision-making process.

The scope of study of the SEA, including the extent and degree of detail of the information to be included in the Environmental Report, were defined as part of a scoping procedure carried out in accordance with the provisions of section 14f of the Environmental Impact Assessment Act with the participation of the authorities whose environmental and health remit is affected by the FTIP.

Following the participation of the public and the authorities and the subsequent review of the Environmental Report within the meaning of section 14k(2) of the Environmental Impact

Assessment Act, the Draft FTIP will be revised taking into account the outcome of the participation exercise. This will then form the basis for the final adoption of the FTIP 2030 by the Federal Government (cabinet decision). The provisions in section 14l of the Environmental Impact Assessment Act state that the adoption of the FTIP by the Federal Government is to be publicly promulgated. As part of this, a statement summarizing the SEA and a list of monitoring measures together with the adopted plan are to be made available for inspection. In addition, section 14m of the Environmental Impact Assessment Act requires the competent authority to monitor the significant environmental effects resulting from implementation of the Plan.

1.2 Outline of the FTIP

The (FTIP) is the most important governance tool for the planning of transport infrastructure for which the Federal Government is responsible. Preparation of the FTIP demonstrates whether new construction and upgrading projects under consideration are worthwhile and necessary on the basis of forecast traffic levels and other parameters. The focus is on a macroeconomic appraisal, taking into account environmental, nature conservation, spatial planning and urban development aspects of all investment projects under consideration. This appraisal is conducted using the same methodology for all projects to prioritize across all modes of transport. This reveals the need for investment in the next ten to fifteen years that will involve great expenditure, have an impact on large areas and produce significant capacity enhancements and/or quality improvements.

The Federal Transport Infrastructure Plan comprises upgrading and new construction projects plus capital maintenance investment and investment in replacement infrastructure. As far as structural maintenance and replacement are concerned, individual measures are not identified. Only the overall need per mode of transport is described. On the other hand, the upgrading and new construction projects are included in the FTIP as individual projects or packages of projects with their appraisal result if they prove to be worthwhile.

In the FTIP, the upgrading and new construction projects are only defined in terms of their basic spatial locations (beginning and end) and the basic project type. A binding decision on their specific spatial location (alignment) is not taken until the subsequent planning process. In the case of road projects, the categorization as a motorway or federal highway to be upgraded or as a new motorway or federal highway and the number of lanes is defined. In the case of rail projects, a decision to upgrade a line or construct a new line with the number of tracks, upgrading the line for a certain speed or electrification is usually taken. Waterway projects regularly involve the upgrading of an existing transport route for larger vessel dimensions and/or for vessels with larger laden draughts plus, in individual cases, capacity

enhancement by constructing additional ship-lifting installations. The upgrading can relate to both a reach (canal, river, fairway in coastal waters) and individual transport structures (locks, boatlifts, bridges). There is virtually no construction of new waterways (new canals), and where there is, it is confined to very short feeder sections, so that it is not relevant to look at alternative routes for waterways.

Other investment going beyond this (for instance noise mitigation measures or cycle tracks on roads for the construction and maintenance of which the Federal Government is responsible) is not the subject matter of the FTIP.

The project proposals appraised as being worthwhile are allocated to the following requirement categories: first priority (VB) with first priority for the removal of bottlenecks (VB-E) and second priority (WB) with second priority with planning go-ahead (WB*). Projects to which a fundamental transport requirement is ascribed but where the level of investment exceeds the financial framework that is likely to be available over the period to 2030 are classified in priority category WB/WB*. Notwithstanding this, however, the FTIP takes into account the environmental effects of both VB and WB projects

The FTIP is developed by the Federal Ministry of Transport and Digital Infrastructure and is adopted by the Federal Cabinet. On the basis of the FTIP, the draft requirement plans for the individual modes of transport are prepared, which are subsequently debated and adopted by parliament within the legislative procedure as annexes to the respective upgrading acts. They contain the need for upgrading and new construction and the priority categorization of the transport infrastructure projects.

Transport infrastructure planning at federal level, with the development of the FTIP and preparation of the requirement plans, is the uppermost tier of a multi-level transport infrastructure planning process. At the lower planning levels, the FTIP's plans are fleshed out in greater depth by the developers and evolved until construction go-ahead can be given (usually plan approval). The times at which the projects are implemented and the order in which they are implemented depend on the degree of priority, the status of planning when construction go-ahead is given and the available funds. In addition to Strategic Environmental Assessment at the level of the FTIP, provision is made for detailed project-related environmental assessment at the lower levels (Environmental Impact Assessment), which means that environmental concerns are mainstreamed.

1.3 Methodology of environmental assessment

The methodology for the Strategic Environmental Assessment of the FTIP 2030 is the result of a process of developing methods lasting several years. The focus is on the upgrading and new construction projects, because only these projects are specifically named in the FTIP,

and it is these projects that may potentially have the most serious environmental effects. For replacement and structural maintenance work, the FTIP 2030 contains only a lump-sum level of investment per mode of transport, which means that the environmental effects of this group of projects can only be roughly estimated and described at the overall plan level.

Section 14g(2)(2) of the Environmental Impact Assessment Act states that identification, description and appraisal of the environmental effects within the scope of SEA is to be geared to the current objectives of environmental protection. In keeping with the spatial level of the FTIP, environmental protection objectives of nationwide significance are of particular importance.

Taking into account the major environmental effects of the FTIP and the current nationally important environmental protection objectives, a catalogue of appraisal criteria has been defined for the SEA for the FTIP. It consists of two parts:

- Part 1 of the appraisal criteria comprises the environment-related criteria of benefit-cost analysis. These are "monetized" criteria.
- Part 2 comprises the supplementary "non-monetized criteria", which reflect the impact of transport infrastructure projects on areas of special importance or sensitivity to encroachment.

The criteria are geared specifically to the planning level of the FTIP. They form the basis for all the major procedural steps within the SEA for the FTIP.

Table 1: Catalogue of criteria for the assessment of the environmental and nature conservation effects of the FTIP – Part 1: monetized environmental criteria from the benefit-cost analysis

No.	Brief description of the criterion	Impact variable
1.1	Change in the number of residents affected by traffic noise (separated into those newly exposed/more strongly exposed and those less exposed)	Number of residents
1.2	Reduction in noise exposure outside built-up areas (fictitious noise abatement wall outside built-up areas)	Area of the fictitious noise abatement wall in square metres
1.3	Carbon dioxide emissions (CO ₂) (from operation and CO ₂ equivalents from life cycle emissions)	Tonnes/year (t/a)
1.4	1.4.a) Emissions of air pollutants - nitrogen oxides (NO _x)	Tonnes/year (t/a)
	1.4.b) Emissions of air pollutants - carbon monoxide (CO)	Tonnes/year (t/a)
	1.4.c) Emissions of air pollutants - hydrocarbons (CO)	Tonnes/year (t/a)
	1.4.d) Emissions of air pollutants – particulate matter	Tonnes/year (t/a)
	1.4.e) Emissions of air pollutants – sulphur dioxide (SO ₂)	Tonnes/year (t/a)

Table 2: Catalogue of criteria for the assessment of the environmental and nature conservation effects of the FTIP – Part 2: non-monetized environmental criteria

No.	Brief description of the criterion	Unit
2.1	Encroachment/adverse impacts on priority nature conservation areas of outstanding significance (network of Natura 2000 sites/nature reserve/national park/biosphere reserve, core and buffer zones of biosphere reserves/Federal Government's large scale nature conservation project, UNESCO World Natural Heritage, Ramsar wetlands)	Area in [ha] (direct encroachment and indirect adverse impacts in impact zone)
2.2	Significant adverse impact on Natura 2000 sites (Natura 2000 impact assessment)	Sites affected [number] (direct encroachment and indirect adverse impacts in impact zone)
2.3	Land take on unfragmented core areas (UFA 250) of the Federal Agency for Nature Conservation's habitat networks	Area in [ha] (direct encroachment and indirect adverse impacts in impact zone)
2.4	2.4.1 a) Severance of large unfragmented areas (UFA 1,000/1,500) of the Federal Agency for Nature Conservation's habitat networks (wetland, dryland and woodland habitats)	Length of severance in [km] (alignment axis)
	2.4.1 b) Severance of large unfragmented areas (UFA 1,500) of the Federal Agency for Nature Conservation's habitat networks (large mammals' habitats)	Length of severance in [km] (alignment axis)
	2.4.1 c) Severance of nationally important habitat arteries/corridors	Severance of arteries/corridors [number]
	2.4.2 Reconnection of habitat networks in upgrading projects	Reconnections of outstanding reconnection sections [number] (manual case-by-case assessment)
2.5	Land take in accordance with the Sustainable Development Strategy (sealed and non-sealed areas)	Area in [ha] (land take in accordance with the Sustainable Development Strategy)
2.6	Traffic passing through floodplains	Length of section in [km] (alignment axis)
2.7	Traffic passing through water protection zones	Length of section in [km] (alignment axis)
2.8	Severance of unfragmented areas with a low density of traffic (>100 km ² in accordance with Federal Agency for Nature Conservation)	Loss of land in [ha] (alignment axis, accounting for remaining effective residual areas)
2.9	Encroachment/adverse impacts on priority cultural heritage and landscape conservation areas (nature parks/areas of outstanding natural beauty/UNESCO World Heritage, biosphere reserves – unless covered by criterion 2.1)	Area in [ha] (direct encroachment and indirect adverse impacts in impact zone)

The environmental effects of all new construction and upgrading projects are described and appraised both on the basis of individual project appraisals (documented in detail in the annexes to the Environmental Report and in PRINS) and on the basis of a summary

consideration of the overall plan. The environmental effects of the ongoing and definitely planned transport projects do not impact on decision-making, because these projects will be delivered irrespective of the commitments made in the FTIP 2030. For this reason, no environmental effects are identified for these projects in the Environmental Report. These projects are usually part of the "without" scenario. In the case of a few ongoing and definitely planned projects, the decision was not taken until 2015 (e.g. start of construction of new roads in the summer of 2015), and these projects are thus not part of the "without" scenario. Since the overall plan effects are always identified in comparison with the "without" scenario, the environmental effects of these projects are identified in summary form as part of the overall plan consideration together with the first priority (VB) projects. In addition, the environmental effects of the projects that have been given plan approval are also appraised and taken into account in the overall plan.

1) Checking the plausibility of alignments from an environmental perspective

Checking the plausibility of alignments from an environmental perspective was one of the major decision-making bases for the phase of project notification and project definition. A project plausibility check related to environmental concerns was carried out here in order to identify and single out projects with obviously avoidable environmental effects.

2) Environmental contribution to project appraisal

The environmental contribution to project appraisal, like the checking of the plausibility of alignments, concerns the individual project level. The impact on environmental concerns is described and appraised for each transport project on the basis of monetized environmentally related criteria of the cost-benefit analysis and non-monetized criteria.

This involves basing the projects on specific alignment axes. However, these are merely possible solutions and are not made mandatory when the decision on the FTIP is taken.

The project impacts are appraised via the monetized criteria on the basis of cost estimates identified via the cost-benefit analysis and are shown as an aggregate as the "total environmental benefit".

Via the non-monetized criteria, the project impacts are also appraised qualitatively in their spatial environmental impacts, although this appraisal is based on quantified impact variables. These quantified impact variables are expressed as "extent of the area affected" in ha, "severance length or length of section" in km or "number of impacts". The degree of impact per criterion is appraised for each project on the basis of a four-tier appraisal scale. Primarily, three result categories on the negative side of the scale are available for this

(high/medium/low). With criterion 2.4.2, the possibility of reconnecting habitat networks in upgrading projects, positive environmental effects are also possible. Appraisal thresholds for the delimitation of the appraisal categories were stipulated as a convention proposal. The next step is an aggregated appraisal per project of all non-monetized environmental criteria on the basis of predetermined aggregation rules.

All the results of the environmental contribution to project appraisal are documented in a project dossier in the form of text and maps and posted in the Project Information System (PRINS), as well as being listed in the Annex to this Environmental Report-

3) Environmental contribution to the overall plan appraisal

The environmental contribution to the overall plan appraisal is used to appraise the impact of the overall plan and accordingly supports the strategic prioritization of all projects in the FTIP. The appraisal takes place at the network level and calculates the total of environmental effects for those upgrading and new construction projects that are categorized as first priority (VB/VB-E) or second priority (WB/WB*) in the FTIP as a whole. In addition, there is supplementary rough summary consideration of environmental effects for the group of capital maintenance investment and investment in replacement infrastructure.

As with the environmental contribution to project appraisal, the environmental contribution to the overall plan appraisal is shown separately for two criterion groups: environmental contribution part 1 based on monetized criteria and environmental contribution part 2 based on non-monetized criteria. The effects are considered on two levels. First, the total of the environmental effects of the first priority projects (VB) with first priority projects for the removal of bottlenecks (VB-E) is calculated. It is assumed that these projects will have been implemented or commenced by 2030. Second, the total of the environmental effects of the second priority projects (WB) with second priority projects with planning go-ahead (WB*) is calculated.

Consideration is based on the same criteria as the project-related appraisal. For each criterion, there is a summary representation of the impact variables and, building on this, a summary appraisal. The monetized environmental criteria are appraised in euros per criterion and as the aggregate of all monetized environmental criteria. The non-monetized environmental criteria are appraised using a five-tier appraisal scale with appraisal thresholds based on the objectives of environmental protection and agreed as a convention with the Federal Agency for Nature Conservation and the Federal Environment Agency.

1.4 Current state of the environment, environmental problems and state of the environment if the plan is not implemented

Section 14g(2)(3) and Section 14g(2)(4) of the Environmental Impact Assessment Act state that the Environmental Report shall provide an account of the environmental characteristics, the current state of the environment and the likely evolution thereof without implementation of the FTIP. Here, account is also to be taken of the environmental problems that are relevant to the FTIP, i.e. the existing environmental pressures especially with regard to the ecologically sensitive areas referred to in para. 2.6 of Annex 4 to the Environmental Impact Assessment Act. This will create a foundation for assessing the probable environmental effects of the FTIP in a further step.

Human health as an asset to be protected

In densely populated Germany, environmental pressures caused by noise are a widespread phenomenon. Traffic noise, in particular, is a nuisance for many people. In Germany, specific noise exposure is recorded as part of the strategic noise mapping conducted under section 47c of the Federal Immission Control Act. Since 2007, "strategic noise maps" have been prepared regularly every five years in conurbations with a population of more than 100,000 and along major transport arteries, main railway lines and at major airports. From these maps, it can be derived that road vehicles cause more noise pollution than trains and aircraft throughout Germany. To mitigate traffic noise, the Federal Ministry of Transport and Digital Infrastructure is seeking to further reduce the noise produced by all modes of transport beyond the level already reached. Greater use is to be made of existing and emerging technical possibilities and the development of innovative noise insulation measures.

Fauna, flora and biodiversity as assets to be protected

Fauna, flora and biodiversity as assets to be protected are covered by several environmental criteria in the Environmental Report. The following types of areas of nature conservation law are summarized as priority nature conservation areas of outstanding significance:

- network of Natura 2000 sites in accordance with section 7(1)(8) of the Federal Nature Conservation Act;
- nature conservation areas in accordance with section 23 of the Federal Nature Conservation Act;
- national parks in accordance with section 24 of the Federal Nature Conservation Act;
- core and buffer zones of biosphere reserves in accordance with section 25 of the Federal Nature Conservation Act;
- large scale nature conservation projects of the Federal Government;

- UNESCO world natural heritage sites;
- Ramsar wetlands.

The aggregate of the aforementioned priority nature conservation areas covers 16 % of the area of the Federal Republic of Germany (land area only, excluding protected areas in the Baltic Sea and North Sea). Adverse impacts on protected areas – especially small protected areas – are the result of uses such as recreational activities, agriculture, forestry, water resources management and transport. In the future, it can be assumed that further priority nature conservation areas of outstanding significance will be designated/recognized and that, despite localized encroachments, there will be no tangible reduction in the aggregate area.

The Natura 2000 network (see section 7(1)(8) of the Federal Nature Conservation Act) constitutes an EU-wide network of protected areas for the conservation of endangered habitats and species in the EU. It comprises the protected areas of the Birds Directive and the protected areas of the Habitats Directive. The possible adverse impacts of the FTIP on Natura 2000 sites are identified and appraised within the scope of criterion 2.2 on the basis of a Natura 2000 screening. A total of 5,346 Natura 2000 sites are registered in Germany (as at October 2013), although SCIs and SPAs overlap in places. The Natura 2000 sites comprise 740 SPAs (Special Protection Areas) and 4,606 SCIs (Sites of Community Importance). In total, they account for just under 15.4 % of the land area of Germany. On land, Special Protection Areas account for 11.2 % (40,110 km²) and Sites of Community Importance account for 9.3 % (33,235 km²). The endangerment factors for the species and habitats protected within the network of Natura 2000 sites include not only intensive use for agricultural purposes but also, and more importantly, the high level of land take as a result of settlement and infrastructure projects and habitat fragmentation. Other factors include the increase in noise emissions, the changes to sensitive habitats caused by increased inputs of pollutants and nutrients plus the negative change in natural functional cycles of soil, water, the climate and air. All these factors can result directly or indirectly in significant adverse impacts on value-enhancing species and habitats of the Natura 2000 sites. The European network of Natura 2000 sites has become consolidated over many years and has been progressively evolved quantitatively and qualitatively. The placing of numerous Natura 2000 sites under protection in Germany is not yet concluded and the designation of strictly protected sites will increase further. It can thus be assumed that this high level of protection will continue to exist.

The Federal Agency for Nature Conservation's "habitat networks" constitute an inventory of significant biotope network structures that is uniform throughout Germany. Building on this, and to assess conflicts with transport infrastructure works, "unfragmented functional areas" (UFAs) have been identified which represent the as yet unfragmented areas with important

habitat functions for species of wetland, dryland and woodland habitats and large mammals. This inventory of areas reflects the occurrence of real-world habitat qualities and the spatial linkage between these core areas. The areas that meet the core UFA criteria (distance category 250 m) comprise a total area of around 51,900 km² across all habitat groups. The area covered by the large UFAs (wetland, dryland and woodland habitats) is around 41 % of the area of the Federal Republic of Germany. That is equivalent to an area of around 145,000 km². Of even greater dimensions are the large UFAs of the large mammals' habitats (distance category 1,500 m). Taken by themselves, they cover around 53 % of the area of the Federal Republic of Germany, which in absolute terms is equivalent to around 189,000 km².

In addition, the "nationally important habitat arteries and corridors" are of great importance for the nationwide system of interlinked biotopes. They represent the networking lines that are to be given priority protection and development in Germany. The total length of the 4,550 nationally important habitat arteries and corridors is around 60,923 km. The existing transport infrastructure network (as at 2010) already severs these habitat arteries in 9,257 cases.

To promote the reconnection of habitats, a sophisticated selection procedure was conducted under the lead responsibility of the Federal Agency for Nature Conservation to identify sections along existing transport infrastructure that have an especially serious severance effect in the context of ecological networking. For these sections, there is a special interest – against the background of the Federal Government's objective of restoring the ecological permeability of fragmented areas – in taking reconnection measures.

Given that the volume of traffic is forecast to rise further over the decades ahead, there is likely to be further upgrading of transport infrastructure at both local and regional levels, irrespective of the FTIP. At the same time, the Biodiversity Strategy states that, by 2020, the existing transport infrastructure is, as a rule, no longer to have any significant adverse impacts on the system of interlinked biotopes and, moreover, that new transport infrastructure is in the future to exhibit sufficient ecological permeability. For this reason, it can be assumed that ecological permeability will play an increasingly important role in the upgrading and construction of roads, railways and waterway links, thereby making it possible to at least reduce further adverse impacts on the Federal Agency for Nature Conservation's habitat networks. Against the background of climate change and the associated need for climate-sensitive species to migrate to climatically more favourable ranges, too, it is to be assumed that the importance of interlinked biotope structures will be enhanced in the future, with the significance of networking structures also increasing.

The Federal Agency for Nature Conservation's habitat networks, the unfragmented functional networks, the habitat arteries and the priorities for the reconnection of ecosystems are covered by criteria 2.3 and 2.4 in the Environmental Report.

Soil and water as assets to be protected

Since the publication of the 2002 National Sustainable Development Strategy, the reduction in land take has been a clearly quantified target. By 2020, new land take is to achieve a figure of 30 ha per day or less, whereas current daily land take is in the order of magnitude of over 70 ha. The regulation of new land take aims to preserve the natural functions of the soil, because any soil that is still in a natural or semi-natural state makes a major contribution towards the performance of significant ecological balance functions, at least in terms of individual soil functions. The greatest share of land take (around 46 %) is accounted for by buildings and open spaces plus areas used for commercial and industrial purposes (four-year mean). Traffic spaces (23 %) play a secondary but not negligible role. The reduction in land take is covered by criterion 2.5 in the Environmental Report.

According to the definition in section 76(2) of the Federal Water Act, defined floodplains are areas in which a flood event is statistically likely once in 100 years. The function of floodplains is to reduce damage caused by flood events and regulate the outflow of flood water. In addition, ecological structures can be preserved and improved there in the area of the floodplains, because species-rich flood meadow biotopes can be preserved or developed through the natural dynamics of flooding in floodplains. Furthermore, floodplains are of great importance for the formation of new groundwater and the regulation of the nutrient balance. The floodplains currently in existence in Germany cover a total area of around 11.400 km². This is equivalent to around 3 % of the total area of Germany. Given the strict regulatory framework governing the determination and protection of floodplains and the fact that their significance has since been recognized, a negative trend is on the whole unlikely for their future development. It is to be assumed that the area covered by floodplains in Germany will tend to increase in the future. Floodplains are taken into account by criterion 2.6 concerning the assessment of the environmental and nature conservation effects.

Water protection zones are identified on the basis of section 51 and section 53 of the Federal Water Act and are placed under appropriate statutory protection. The objective of determining water protection zones is to protect surface water and groundwater that is of importance for protecting the existing or future public water supply against negative impacts, to enrich the groundwater or to prevent the harmful run-off of rain water into bodies of water. Accordingly, medicinal spring protection areas are determined for the protection and safeguarding of officially recognized medicinal springs. Water protection zones always cover

the entire catchment area of a drinking water well head. They are divided into different zones, with the need for protection decreasing as the distance from the well head increases. In 2010, according to information provided by the Federal Environment Agency, there were a total 30,045 water protection zones on an area of 50,400 km². This is equivalent to around 14 % of the total area of Germany. Given the great importance of the protection of drinking water, it can be assumed that the condition of the bodies of water protected by water protection zones and medicinal spring protection areas will not on the whole deteriorate and will be further improved in the future. Possible impacts on water protection zones are shown in criterion 2.7.

Climate and air as assets to be protected

Air pollutants can have adverse impacts not only on human health but also on flora and fauna plus structures. In the Environmental Report, they are taken into account via the monetized appraisal criteria 1.3 and 1.4.

Here, the air pollutants relevant to transport are considered. These include the oxides of nitrogen (nitrogen monoxide (NO) and nitrogen dioxide (NO₂)), carbon monoxide (CO), hydrocarbons, particulate matter and sulphur dioxide. In terms of the number of times that limit values are observed to have been exceeded, the main focus of air quality management is on the oxides of nitrogen and particulate matter.

The main sources of the oxides of nitrogen are internal combustion engines and combustion plants for coal, oil, gas, wood and waste. Total emissions of oxides of nitrogen were reduced by 1.62 million tonnes (i.e. 56 %) between 1990 and 2013. However, the transport sector continues to be the greatest polluter, with a share of 41 % of all NO_x emissions. Here, further reduction efforts are necessary, although the transport sector has, in the past few decades, already made an above-average contribution towards lowering emissions of oxides of nitrogen in Germany.

Particulate matter (PM) consists of a complex mixture of solid and liquid particles. A distinction is made between PM 10 with a maximum diameter of 10 micrometres (µm), PM 2.5 with a maximum diameter of 2.5 µm and ultrafine particles with a diameter of less than 0.1 µm. Primary particulate matter is caused by emissions from motor vehicles, especially those with diesel engines, power plants and district heating plants, furnaces and heating systems in residential buildings, the production of metal and steel or the handling of bulk cargo. However, it can also have a natural origin, for instance as the result of soil erosion. In conurbations, road traffic is the dominant source of particulate matter. Another major source is agriculture. Since 1995, emissions of particulate matter have declined significantly in

Germany. Nevertheless, the statutory daily limits are still regularly exceeded at individual monitoring stations close to traffic. For this reason, further reduction efforts, especially in the transport sector, are necessary with regard to particulate matter as well.

Whereas the aforementioned air pollutants can trigger acute environmental risks, climate change gases (greenhouse gases) have an impact on global climate change. According to the Kyoto Protocol, a total of six greenhouse gases play the crucial role in the anthropogenic greenhouse effect. Carbon dioxide (CO₂) has the highest mass percentage of the anthropogenic greenhouse gas emissions. The other greenhouse gases – methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) – are released in far smaller quantities than CO₂ but are much more harmful to the climate. To compare the gases, their global warming impact is placed in relation to that of CO₂ as a "carbon dioxide equivalent" (CO₂eq). For the transport sector, it is carbon dioxide emissions that play the crucial role. It is true that total greenhouse gas emissions fell by 25.6 % in Germany over the period from 1990 to 2011. Nevertheless, the Federal Government's objectives for a reduction in greenhouse gas emissions are very ambitious, which means that a further reduction in emissions is necessary. The transport sector currently accounts for around 16 to 20 % of CO₂ emissions.

Landscape, cultural heritage and other material assets as assets to be protected

"Unfragmented areas with a low density of traffic" (UALTs) are an indicator of large areas of unfragmented landscape and are taken into account by criterion 2.8 in the Environmental Report. UALTs are all landscape areas that are not fragmented by physical barriers such as roads with more than 1,000 motor vehicles/24h, double-track railway lines or single-track electrified railway lines, settlements, airports or canals with the status of a Category IV or higher federal waterway and are larger than 100 km². In 2010, the total size of UALTs in Germany was 82,445 km², thus covering around 23 % of the total land area of Germany. Over the last 20 years, however, the density of the transport network in Germany has steadily increased, which means that the share of the UALTs has also declined. In the future, investment is to focus on upgrading the existing network in order to preserve the current share of unfragmented areas with a low density of traffic.

The following types of area can be described a further priority areas of nationwide significance as regards the protection of the cultural heritage and the landscape;

- nature parks;
- landscape conservation areas (that are not Natura 2000 sites);
- UNESCO world cultural heritage sites;
- development zones of the biosphere reserves.

Most of these categories of protected area are of a large-scale nature. The aggregated inventory of the aforementioned priority areas that are the subject of the protection of the cultural heritage and the landscape cover a total of around 151,365 km², which is equivalent to around 42 % of the area of the Federal Republic of Germany (excluding protected areas in the North Sea and Baltic Sea). Encroachment/adverse impacts on priority cultural heritage and landscape conservation areas are taken into account via the non-monetized criterion 2.9.

1.5 Environmental impacts at project level

Consideration of alternatives at project level

Initially, alternatives were considered at project level for the road mode within the scope of the federal states' preparations to notify their projects. As part of their notification of road construction projects, the federal states had to state the extent to which "possible alternative solutions" had been considered. With regard to conflicts with nature and the environment, they had to describe whether alternative plans (for instance upgrading rather than new construction, occasionally also alternative modes of transport) had been considered. The statements made by the federal states on the consideration of alternatives can be viewed in the PRINS Project Information System (www.bvwp2030.de).

As part of the appraisal of road projects, the projects were considered in terms of nationwide intramodal interdependencies. This involved identifying the transport-related dependencies and interactions between the individual projects. On the corresponding origin-destination pairs affected by interdependencies, the total over all projects is a motor vehicle mileage on the target network that is on average around 3 % lower than the total of all motor vehicle mileages calculated for all individual projects. On the basis of the project-specific deviations, an examination was conducted to determine the extent to which competition between projects resulted in appreciable changes in the project benefit of the individual benefit-cost analyses. This examination revealed that there are no significant changes in the BCR and that it is thus not necessary to modify the envisaged requirement classification.

In the case of the rail mode, a rough study was carried out to estimate whether a project had a chance of being included in the FTIP. In some cases, this represented a consideration of alternatives with regard to the preselection of projects, namely if there were various proposals for the solution of the same transport problem. For the individual rail projects, appraisals were initially conducted without taking into account possible intramodal interdependencies between the projects to be studied. In the subsequent target network calculations, the projects were reviewed to determine whether there are any competitive

relationships between projects. It became apparent that in some projects there are overlaps between the demand segments benefiting from the schemes concerned. This is the case, for instance, in the following two projects: construction of a new line from Gelnhausen to Mottgers (project no 2-002-V02) and upgrading of the Gelnhausen – Kalbach/Aschaffenburg – Nantenbach lines/construction of new lines (project no 2-007-V01). Since implementation of both projects would not represent overall value for money, a decision on which option to pursue will be taken by the developer in the course of further planning. As far as other intramodal interdependencies that exist from the consultants' perspective are concerned, detailed examinations will be conducted subsequent to the FTIP to determine the extent to which these are relevant to the precise project definitions. "Project optimization", which relates for instance to different sizings of the individual projects, is also to be considered a further form of the consideration of alternatives.

In the case of waterways, a rough estimate was first conducted – as in the case of the rail mode – to determine whether a project could reach the economic break-even point at all. Those projects that reach the economic break-even point were completely appraised within the scope of the FTIP, taking environmental concerns into account. Possible intramodal interdependencies were also taken into account for waterways as part of the project appraisals. The consultants came to the conclusion that there are no interdependencies relevant to decision-making between the appraised waterway projects.

After the modal project appraisal and the associated intramodal (i.e. relating to the individual modes of transport) consideration of alternatives, the second step involves carrying out a systematic cross-modal consideration of alternatives. To examine possible intermodal interdependencies between FTIP 2030 projects, the project-induced modal shift impacts between the modes of transport were compared. Here, the only interdependencies that were of importance were those that question the final business case of individual projects. For the road mode, modal shift calculations were conducted in the benefit-cost analysis to quantify the potential shifts from long-distance passenger rail services to private motorized transport. The shifted traffic has no significant impact on the results of the benefit-cost analyses. Accordingly, there are not likely to be any interdependencies impacting on the projects' value for money. For an examination of intermodal impacts in passenger rail transport, the demand quantities shifted from the railways to the roads on the target network of the road mode were passed on to the "road" consultant by the "rail" consultant. On this basis, possible impacts on the rail project appraisals were examined. The outcome is that relevant intermodal impacts by the roads on the railways are not apparent. In addition, a closer look was taken at the impact of road projects in the FTIP on individual rail projects. This showed that the fall in demand resulting from the road projects exceeded an order of magnitude of 1 % on the

railways in only a very few cases. The proportion of shifts between the rail and waterway modes is focused on a very small number of projects and, with an overall average of 2 %, is very low. Intermodal interdependencies between the railways and waterways that are relevant to appraisal can thus be ruled out. The capacity enhancement resulting from the rail projects means that this demand can move from HGVs to the railways. This level of traffic would still go predominantly by rail if the road network were to be improved at the same time. There is thus not likely to be a major change in the appraisal results in rail freight as a result of taking intermodal network effects into account. In the case of waterway projects, there are almost no intermodal interdependencies with road or rail projects.

Results of the environmental contribution to the appraisal of individual projects

For those upgrading and new construction projects that were basically eligible for project prioritization taking into account the results of the project pre-selection, a project-related environmental assessment was carried out. A total of around 2,000 projects or component projects were considered as a basis for the project-related prioritization. The complete environmental contribution of the individual project appraisal is documented in the relevant dossier of the Project Information System (PRINS) (see www.bvwp2030.de).

Road mode

The results of the monetized environmental criteria exhibit great scatter. The highest positive environmental benefit is €99.9 million and the lowest value is €-498.8 million. CO₂ emissions usually have the greatest impact on the total environmental benefit. A total of 616 road projects (56 % of those appraised) have an overall positive environmental benefit. 482 (44 % of those appraised) have an overall negative environmental benefit.

Of the total of 819 new construction projects and projects with new construction sections appraised and included in the FTIP, 160 (i.e. just under 20 %) were appraised as having a high level of environmental impact. 402, and thus around one half (49 %) of the new construction projects have a medium level of environmental impact, while the remaining 257 (31 %) projects have a comparatively low level of environmental impact.

Of the 254 projects involving solely upgrading work appraised and included in the FTIP, around 120 projects (47 %) were appraised as having a medium level of environmental impact and 134 projects (53 %) were appraised as having a low level of environmental impact.

A total of 1,073 upgrading and new construction projects in the road mode were appraised and included in the FTIP. Of these, a total of 160 projects (15 %) were appraised as having a

high level of environmental impact and 522 (49 %) projects were appraised as having a medium level of environmental impact. 391 projects (36 %) exhibit a low level of environmental impact.

Natura 2000 sites are affected by 171 new construction or upgrading projects classified as having a high level of environmental impact and by 227 projects classified as having a medium level of environmental impact. In the case of these projects, significant adverse impacts on Natura 2000 sites cannot be ruled out, which means that, at the lower planning levels, a thorough assessment of their compatibility with the Habitats Directive and, if necessary, a procedure for granting exemption from the Habitats Directive are to be carried out.

Rail mode

The results of the monetized environmental criteria exhibit less scatter than is the case with the road projects. All projects appraised and included in the FTIP have a positive total environmental benefit. The highest value is €742.9 million and the lowest value is €37.9 million. The environment-related benefit components of "noise within built-up areas" and "CO₂ emissions" usually have the greatest effect in terms of relieving environmental pressure.

Of the total of 10 new construction projects and projects with new construction sections appraised and included in the FTIP, 8 (i.e. 80 %) were appraised as having a high level of environmental impact. One project has a medium level of environmental impact while one further project has a comparatively low level of environmental impact.

Of the four projects involving solely upgrading work appraised and included in the FTIP, three projects were appraised as having a medium level of environmental impact and one project was appraised as having a low level of environmental impact.

Of the total of 14 upgrading and new construction rail projects appraised and included in the FTIP, 8 projects (57 %) were appraised as having a high level of environmental impact and 4 projects (29 %) were appraised as having a medium level of environmental impact. Two projects (14 %) exhibit a low level of environmental impact.

Natura 2000 sites are affected by 12 new or upgrading projects, of which 8 projects are classified as having a high level of environmental impact and 4 projects are classified as having a medium level of environmental impact. In the case of these projects, significant adverse impacts on Natura 2000 sites cannot be ruled out, which means that, at the lower planning levels, a thorough assessment of their compatibility with the Habitats Directive and,

if necessary, a procedure for granting exemption from the Habitats Directive are to be carried out.

Waterway mode

The results of the monetized environmental criteria also exhibit great scatter in the case of the waterways. The highest value is €696 million and the lowest value is €-7.7 million. 24 (i.e. 85 %) of the projects have a positive environmental benefit. A mere 4 (i.e. 15 %) of the projects have a negative environmental benefit in their aggregated emissions of air pollutants and greenhouse gases.

Of the total of 25 waterway projects appraised and included in the FTIP, 4 (i.e. 16 %) were appraised as having a high level of environmental impact. 12, and thus around one half (48 %), have a medium level of environmental impact, while the remaining 9 (36 %) projects have a comparatively low level of environmental impact.

Natura 2000 sites are affected by 4 projects classified as having a high level of environmental impact and by 8 projects classified as having a medium level of environmental impact. In the case of these projects, significant adverse impacts on Natura 2000 sites cannot be ruled out, which means that, at the lower planning levels, a thorough assessment of their compatibility with the Habitats Directive and, if necessary, a procedure for granting exemption from the Habitats Directive are to be carried out.

1.6 Environmental effects at network level

Alternative investment scenarios on the basis of strategic prioritizations

To check how various investment strategies, with the resultant allocations of funding to the individual modes of transport, impact on the effects of the overall plan, a corresponding consideration of alternatives was carried out. The Environmental Report provided an account of the impacts of the alternative scenarios on the environment.

Three investment scenarios were studied. Scenario 1 is based on traffic in terms of passenger and tonne kilometres for the modes of transport in Germany. The mode of transport with the highest figure is road – in both passenger transport (87 % of passenger kilometres in 2014) and freight transport (71 % of tonne kilometres in 2014). Accordingly, this scenario produced a road-heavy distribution of funding. Scenario 2 takes as its starting point the distribution of the funds for upgrading and new construction in the 2016 budget and rolls them forward to the FTIP planning horizon in 2030. Scenario 3 is based on the Sustainable Development Strategy, which has formulated as its objective a shift to environmentally

sustainable modes of transport. Accordingly, it made provision for stepping up investment in the railways and waterways.

The objective was to generally show what effects the distribution of funding will have. Hence, the strategic distribution of funding was not to be intermingled with the question as to which individual projects will actually be delivered in the modes of transport. For this reason, mean project impacts per invested euro were calculated for each mode of transport to estimate the effects of the overall plan.

It is apparent that scenario 3, which invests funds in the rail and waterway modes on a larger scale than the other scenarios, performs comparatively favourably in most environmental criteria. However, this scenario is less favourable as regards the creation of new noise or an increase in noise exposure within built-up areas, the emissions of carbon dioxide, land take on priority nature conservation areas and the severance of nationally important habitat arteries and corridors.

Total environmental effects of the first priority new construction and upgrading projects (VB/VB-E)

This group comprises all new construction and upgrading projects that will be physically implemented or on which work will commence within the planning horizon of the FTIP to 2030. It includes all first priority projects (VB) with first priority projects for the removal of bottlenecks (VB-E). The values for ongoing and definitely planned projects are also integrated unless they have already been part of the "without" scenario.

A total of 605 upgrading and new construction road projects, 16 upgrading and new construction rail projects and 22 waterway projects have been categorized as first priority projects. In the case of the roads, 455 of these projects are new construction projects or upgrading projects with a proportion of new construction and 155 of these projects involve solely upgrading work.

Table 3 summarizes the environmental effects across all modes of transport. On this basis, a summary environmental impact appraisal is then carried out in accordance with the predetermined methodological rules.

Table 3: Cross-modal description and appraisal of the environmental effects of the first priority projects (VB/VB-E)

Criteria		Impact variable		Assessment	
1. Monetized criteria					
1.1	Noise exposure in built-up areas				
	- Exposed to new or higher levels of noise	833,735	Residents	3,285	€ m

Criteria		Impact variable		Assessment	
	- Exposed to less noise	2,274,415	Residents		
1.2	Noise exposure outside built-up areas	9,069	m ² thousands	-2.049	€ m
1.3	CO ₂ emissions	-491.453	t/a	1,191	€ m
1.4	Emissions of noise pollutants	17,549	t/a	1,216	€ m
Total environment benefit (criteria 1.1 to 1.4)				3,644	€ m
2. Non-monetized criteria					
2.1	Encroachment/adverse impacts on priority nature conservation areas	3,344.1	Area [ha]	--	
2.2	Significant adverse impacts on Natura 2000 sites - Not ruled out - Probable	374.0	Number of sites	--	
		128.0	Number of sites		
2.3	Land take on unfragmented core areas of the Federal Agency for Nature Conservation's habitat networks	1,236.6	Area [ha]	-	
2.4	Severance of large unfragmented areas and arteries/corridors of the Federal Agency for Nature Conservation's habitat networks				
	2.4.1a) Large areas of wetland, dryland and woodland habitats	728.0	Length of severance [km]	-	
	2.4.1b) Large mammals' habitats	1,175.1	Length of severance [km]	-	
	2.4.1 c) Nationally important habitat arteries/corridors	73	Number	0	
	2.4.2) Reconnection of habitat networks in upgrading projects - "Defragmented" - Not "defragmented"	26	Number	+	
		6	Number		
2.5	Land take	15,512.1	Area [ha]	-	
2.6	Traffic passing through floodplains	109.5	Length of severance [km]	-	
2.7	Traffic passing through water protection zones	80.2	Length of severance [km]	-	
2.8	Severance of unfragmented areas with a low density of traffic	85,293.2	Area [ha]	-	
2.9	Encroachment/adverse impacts on priority cultural heritage and landscape conservation areas	7,004.8	Area [ha]	-	

The monetized environmental criteria present a heterogeneous picture. As far as noise exposure within built-up areas (criterion 1.1) is concerned, there is on balance an improvement in the situation. In open spaces, however, new areas are exposed to noise (criterion 1.2). The carbon balance sheet shows a positive picture, i.e. in the aggregate of all VB/VB-E projects, there is a reduction in CO₂ emissions (criterion 1.3). On the other hand, there is an increase in the level of air pollutants, although they are not of great consequence, because the absolute orders of magnitude are relatively low and there are slight reductions in

the especially relevant substance of groups of nitrogen oxides and particulate matter. Across all VB/VB-E projects, there is a positive total environmental benefit of 3,644 million euros.

Across all modes of transport, the aggregated first priority projects make a significantly negative contribution towards achieving the objectives with regard to criteria 2.1 (encroachment/adverse impacts on priority nature conservation areas), 2.2 (significant adverse impacts on Natura 2000 sites) and 2.8 (severance of unfragmented areas with a low density of traffic). With regard to criteria 2.3 (land take on unfragmented core areas of the Federal Agency for Nature Conservation's habitat networks). 2.4.1a) (large areas of wetland, dryland and woodland habitats) and b) (large mammals' habitats), 2.5 (land take), 2.6 (traffic passing through floodplains), 2.7 (traffic passing through water protection zones) and 2.9 (encroachment/adverse impacts on priority cultural heritage and landscape conservation areas), the total impact of all VB/VB-E projects constitutes a negative contribution towards achieving the objectives of environmental protection. The new construction projects of the FTIP add only 81 severances of nationally important habitat arteries and corridors (criterion 2.4.1c)), which is why the objective of causing no further severance of nationally important habitat arteries/corridors can be considered as being met according to the assessment scheme. Here, the projects included in the FTIP already contain numerous measures for the maintenance of habitat corridors and systems of interlinked biotopes. First priority upgrading projects are likely to have a positive impact in the form of the "defragmentation" of habitat networks (criterion 2.4.2).

The assessment of the effects of the FTIP 2030 projects can be qualified in that the alignment options taken as a basis in the Environmental Report are merely possible solutions. Thus, it is not possible to determine the likely extent of the effects in more concrete terms until the determination of the alignment at the lower planning levels. With the detailed alignment, it will probably be possible to further minimize land take and adverse impacts as well as severance. Provision is made for monitoring measures to capture the extent of corresponding planning optimization.

Total environmental effects of the first priority (VB/VB-E) and second priority (WB/WB*) new construction and upgrading projects

This package of projects comprises not only the first priority projects (VB/VB-E) but also all second priority construction and upgrading projects (WB), including second priority projects with planning go-ahead (WB*). This means that it contains all upgrading and new construction projects included in the FTIP.

The Environmental Report also described and assessed the summary environmental effects of this total package of new construction and upgrading projects. With this approach, however, it must be taken into account that, although projects classified in priority category WB/WB* are ascribed a fundamental transport requirement, the level of investment exceeds the financial framework that is likely to be available over the period to 2030. For these projects, unlike the VB/VB-E projects, it is thus not possible to state a specific timescale for delivery. For this reason, this summary consideration is more of a theoretical nature.

The total of all first and second priority projects makes significantly negative contributions towards achieving the environmental objectives with regard to criteria 2.1 (encroachment/adverse impacts on priority nature conservation areas), 2.2 (significant adverse impacts on Natura 2000 sites), 2.4.1 a) (large areas of wetland, dryland and woodland habitats) and b) (large mammals' habitats) and 2.8 (severance of unfragmented areas with a low density of traffic). With regard to criteria 2.3 (land take on unfragmented core areas of the Federal Agency for Nature Conservation's habitat networks), 2.4.1c) (severance of nationally important habitat arteries/corridors), 2.6 (traffic passing through floodplains), 2.7 (traffic passing through water protection zones) and 2.9 (encroachment/adverse impacts on priority cultural heritage and landscape conservation areas), the total impact of all VB/VB-E and WB/WB* projects constitutes a negative contribution towards achieving the objectives of environmental protection. On the other hand, first priority upgrading projects are likely to have a positive impact in the form of the "defragmentation" of habitat networks (criterion 2.4.2).

Environmental effects of replacement/structural maintenance work

For replacement and structural maintenance work, the FTIP exhibits only a lump-sum level of investment per transport mode group. At the level of the FTIP, the nature, scope and spatial location of replacement/structural maintenance work to be funded are not determined.

Since replacement/structural maintenance work merely involves refurbishment or exchange measures on existing transport infrastructure, it does not usually result in any additional land take or severance effects. Additional adverse impacts caused by the installation itself are thus generally unlikely. However, temporary adverse impacts caused by the construction work usually do occur while the construction work is being carried out.

When it comes to the fundamental question as to whether the replacement/structural maintenance work planned with the FTIP should be carried out at all, the likely environmental effects (caused by construction) are usually not relevant to decision-making. The specific appraisal of each individual case is the prerogative of the authorizing level.

1.7 Transboundary environmental effects

All upgrading and new construction transport infrastructure projects planned with the FTIP are located within the borders of Germany. Nevertheless, transboundary transport effects are possible on the cross-border feeder routes. Some projects in areas close to borders can also have direct transboundary environmental effects if the zone of impact of an individual project crosses a border. Only 13 road construction projects and 2 waterway projects are affected by this. The Environmental Report examined whether the possible transboundary effects of these projects result in a different appraisal category in the case of the non-monetized criteria. This is not the case with any of the projects close to borders.

1.8 Information on difficulties encountered in compiling the data

Of necessity, the environmental assessment for the Federal Transport Infrastructure Plan had to pay due regard to the higher planning level. At this level, only initial rough planning statuses are available for numerous projects. The projects' alignments have not yet been finalized. The depth of assessment is thus adapted accordingly. The results are subject to the proviso of further optimization of the alignment planning at the lower planning levels.

Because of the need to use data and information bases available throughout Germany, there was a very limited selection for the criteria used within the scope of the environmental assessment. It would be desirable, from a professional perspective, to additionally consider further data relating to the following assets: landscape, soil and protected species. More in-depth assessments of these thematic areas must be carried out at the lower planning levels.

There was also limited data availability for the area of noise impact. In particular, it was not possible to include the local terrain conditions for each project. In addition, there is as yet no area-wide dataset transcending federal state boundaries on existing ambient noise pollution. Here, too, specific impact forecasts thus have to be made at the lower planning level.

A fully-fledged appraisal was not possible for rail projects which, because detailed planning is still pending, cannot be fleshed out until the FTIP has been adopted. Here, all that was possible was an estimate of the impact of the relevant criteria for the overall plan level on the basis of average values.

1.9 Planned monitoring measures

Section 14m and Section 14g(2)(9) of the Environmental Impact Assessment Act state that provision is to be made, within the scope of SEA, for measures to monitor the significant environmental effects that may result from implementation of the FTIP.

At the FTIP level, the main objective of the monitoring measures to be established for the FTIP is to draw conclusions as to how future Strategic Environmental Assessments of the FTIP can be improved. The effects of the overall plan are the subject of the monitoring activities. Individual projects are only considered if construction has commenced and there have been significant changes (e.g. alignment, chosen option) compared with the status of planning in the FTIP. The scope and level of detail of the monitoring activities is based on the environmental criteria considered at the level of federal transport infrastructure planning. A suitable reference time for monitoring the FTIP is the review of the requirement plans. At this point in time, the following individual steps are to be carried out:

- 1) conduct a survey to determine those projects on which construction has commenced;
- 2) compare the technical planning/alignment of the approved project with the project appraised in the FTIP;
- 3) identify the impacts on the environment with regard to the SEA criteria for the approved projects if they differ significantly from the projects appraised in the FTIP;
- 4) cross check the environmental impacts, identified using the SEA methodology, of the original overall plan and after its implementation¹.

The monitoring of the environmental effects is to be based on the same environmental criteria as were used in the Environmental Report to describe and appraise the environmental effects. In the interests of procedural economy, a good time to conduct the monitoring is when the requirement plans are being reviewed (after the expiry of five years under section 4 of the Federal Trunk Roads Upgrading Act and section 4 of the Federal Railway Infrastructure Upgrading Act), because there may be synergies in terms of subject matter, staffing and infrastructure. It is probably not necessary to commence monitoring activities any earlier, because an initial monitoring report does not make sense until a sizeable number of projects have been approved and construction has started.

The Environmental Impact Assessment Act states that the results of the monitoring are to be made accessible to the public and the authorities referred to in the Act. For this purpose, the results are to be documented in a report, intelligible to the general reader, which summarizes the major findings. The report is to be published in a suitable form at the time when the requirement plans are reviewed.

¹ This cross-check comprises both the projects on which construction has commenced which, in accordance with 3), differ significantly from the projects appraised in the FTIP and such projects where no differences were identified.