



SUNRA

Sustainability – National Road Aministrations

**Questionnaire on sustainability tools
used by NRAs**

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1 Introduction

Due to their role and size, National Road Administrations (NRAs) have a significant impact on society and the environment. Therefore, NRAs play a crucial part in the implementation of sustainability development. NRAs increasingly seek instruments to assess the sustainability of their work. As this project aims to design a framework for a sustainability rating system for NRAs it is essential to understand the current situation with respect to sustainability rating systems across NRAs in Europe.

A questionnaire has been developed to assess the current practice of NRAs in terms of sustainability, covering issues such as state of the art, best practices, good ideas and development needs.

The word “sustainability” can be interpreted in many ways. In this questionnaire we choose a broad definition in order to make sure that we collect all sustainability initiatives. Following the Triple Bottom Line definition¹, sustainability consists of three pillars comprising the economic, the environmental and the social aspects.

The initial results of the questionnaire are discussed in chapters 3 and 4. The results have been anonymised, with the names and contact details of respondents hidden. The contributing institutions are listed in Appendix A. In the last chapter (5), the results are summarized and recommendations for the SUNRA project are given.

¹ See: John Elkington (1997). Cannibals with Forks: the Triple Bottom Line of 21st Century Business.

2 Methodology

As outlined in the introduction, a questionnaire was developed in order to obtain information from the NRAs and other involved parties about their current practice, interests, best practices and needs on sustainability issues in road infrastructure projects.

The questionnaire was developed in several stages. First, a literature review and evaluation of knowledge from previous projects was performed in order to make a list of potential topics to question the NRAs about. The triple bottom line¹, which defines sustainability as a balance between the three pillars: *people*, *planet* and *profit*, was selected to provide the structure of the questionnaire. In the questionnaire a broad definition of sustainability was used in order to make sure that information was collected on all sustainability aspects and initiatives.

These aspects were included in two parts of the questionnaire. The first part comprised a series of multi-choice questions, used to obtain an impression of what aspects of sustainability are important within the organisations. The second part comprised open questions where more details was asked on the sustainability strategies and instruments currently used by the NRAs, their future ambitions, and the research needed to fulfil these ambitions.

Once the questionnaire was developed, it was piloted with three NRAs. With their feedback, the questionnaire was improved, finalized and then sent to 22 parties during summer 2012. Several reminder emails were sent out to non-respondents in order to obtain as many responses as possible.

The returned questionnaires were analysed for as far as they were filled in, in order to make maximal use of all given information. Of the 17 people who returned the questionnaire, everybody answered the economic and environmental multiple choice questions. The social multiple choice questions were answered by one person less (16). The open questions were answered by 15 people.

The results were analysed per questionnaire. First, the multiple choice questions were plotted in graphs and analysed per group of sustainability aspects (for example, all economic aspects together). The results from the multiple choice questions can be found in the next chapter. The open questions were analysed one by one. The results of this analysis are discussed in chapter 4.

Lastly, the results were summarized and main lessons were drawn out of the overall picture.

The questionnaire is given as Appendix B.

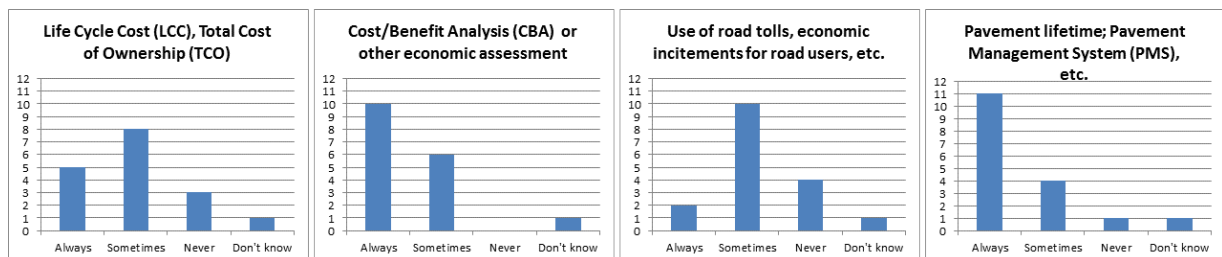
3 Results multiple choice part questionnaire

The multiple choice questions were divided into the three pillars: economic, environmental and social. They will also be reported and discussed in these pillars. The questions were asked in a general manner, a number of sustainability aspects were listed, and the respondents were asked to indicate if their organisation considered these aspects in their operations, they could choose between “always”, “sometimes”, “never” and “don’t know”. “Always” is used as indication that this aspect is subject to some type of requirement in all projects run by the NRA. “Sometimes” indicates that this aspect is taken into account in specific selected projects or in pilot projects.

3.1 Economic

In the graphs below it can be seen that across Europe NRAs do not have a general approach to the economic aspects of sustainability. Some of them use Life Cycle Costing in all projects, some sometimes and some never. With respect to Cost Benefit Analyses these are either used sometimes or always. Road tolls and economic incitements for road users are sometimes used. Most NRAs use some kind of pavement management system in order to make sure that maintenance is performed where most needed.

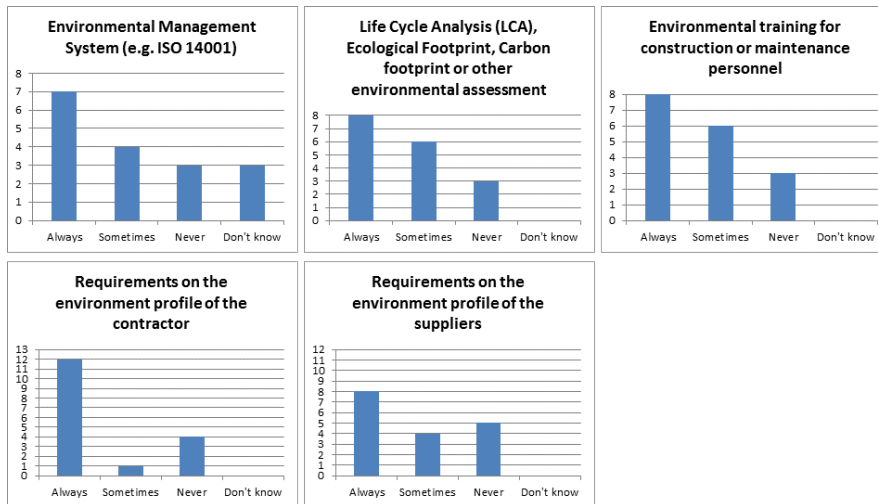
From the total it becomes clear that most NRAs use integral approaches to optimise economic decisions with respect to roads projects to some extent, however it is by no means standard across Europe.



3.2 Environmental

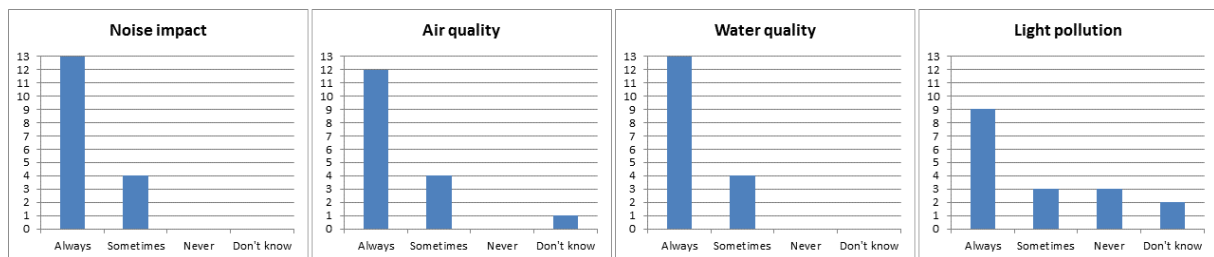
3.2.1 General

The general questions on environmental aspects show that most NRAs pay attention to the environment to some extent. Ten out of seventeen respondents applied an environmental management system such as ISO 14001, either always or sometimes. Half of the NRAs always provide environmental training and three quarters set requirements for the environmental profile of the contractor. The amount of NRAs that always set requirements for suppliers is about equal to the amount of NRAs that does not or does only sometimes.



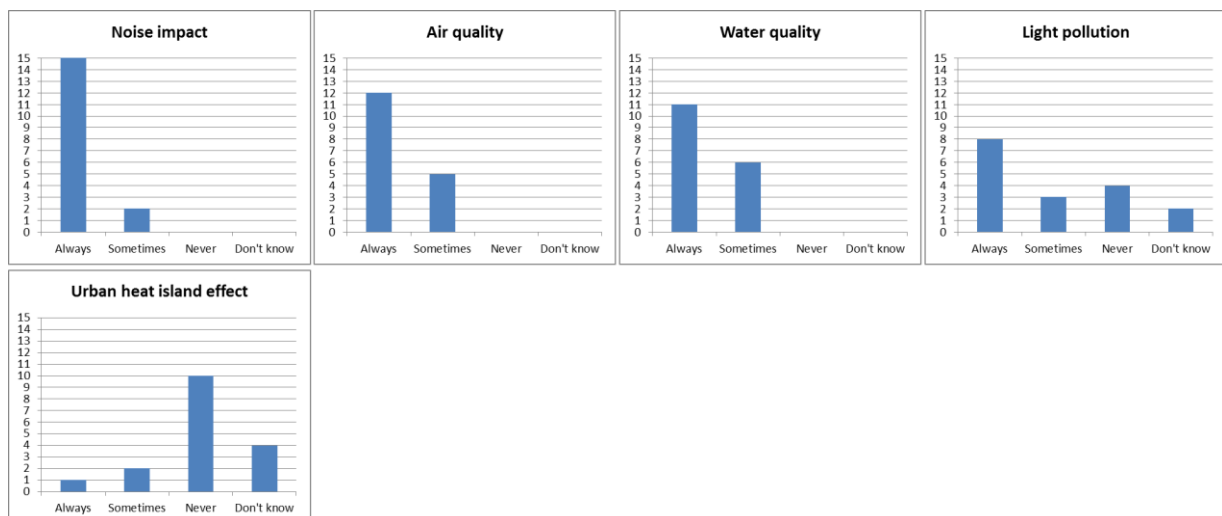
3.2.2 Pollution during construction

During construction almost all NRAs pay attention to noise, air and water quality at least in some cases. Less attention is paid to light pollution; with only half of the NRAs saying they do this on a regular basis (always).



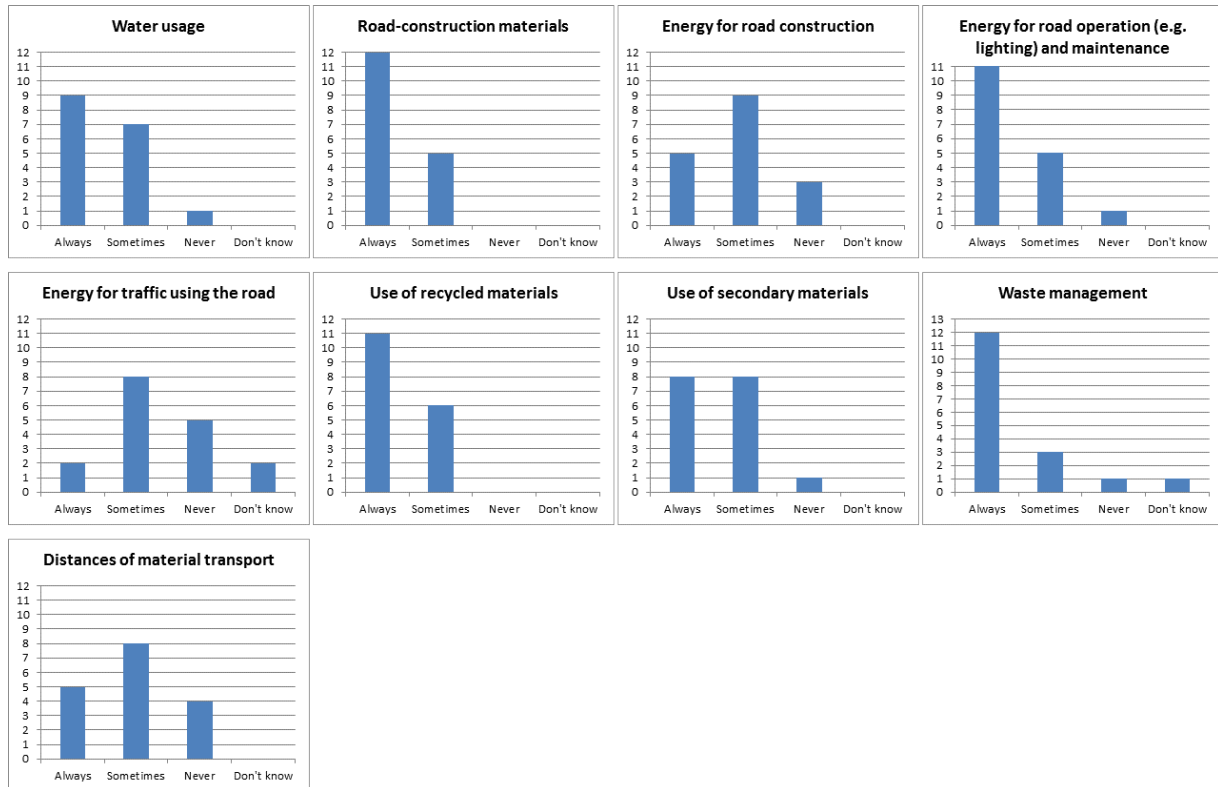
3.2.3 Pollution during operation

During operation all except one NRA always pay attention to noise. All pay attention to air and water quality, with three quarters paying attention to it always and one quarter sometimes. Less attention is paid to light pollution, while only three NRAs indicate that in some cases the urban heat island effect is taken into consideration.



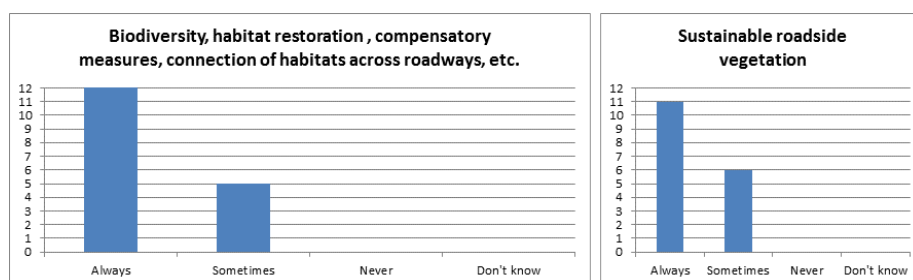
3.2.4 Natural resources

At most NRAs the environmental impact of water usage and construction material usage is considered one way or another. A large majority of the NRAs always pay attention to road construction materials, energy for road operation, the use of recycled materials and waste management. Less attention is paid to the energy needed for construction, the energy for traffic using the road, and the material transport distances.



3.2.5 Nature

Three quarters (12 out of 17) of the NRAs always take aspects like biodiversity or habitat restoration into account, while other NRAs do this sometimes. Again three quarters of the NRAs always care for sustainable roadside vegetation; the others do this only sometimes.



3.2.6 Comments regarding environmental questions

Respondents were also invited to provide additional comments. The following comments were made by the respondents:

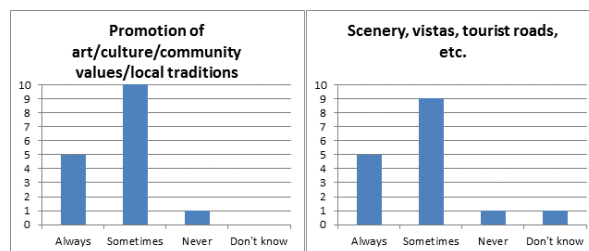
- Under the environmental pillar I have answered some questions based on our procurement policies and the known practices of principal contractors. 90% of what we do is delivered by third parties so it's important to include this perspective.

- Environmental: General, question no 5: It's an issue for the contractor to interpret our requirements. The Transport Administration is not buying any road construction materials.
- Environmental: Natural resources, Q 1: There is no lack of water in Sweden so usage is not a problem, but any influence on the hydrology must be approved as well as construction works in water or affecting waters.
- Q 9: Transport distances is more of an economical question.
- Overall comment: many of the aspects are handled by European and national legislation (waste management, assessment of the effects on the environment (85/337/EEG), ...) and are not specific for the road administration. They are classified as being always subject of requirement.
- Use of road tolls, economic incitements for road users, etc is set to 'never', though one tunnel uses toll and one to be built is considered to be toll-bases. Still we classified it as 'never' since these two (from only one is already constructed, the other one is being studied only) are the very rare ones.
- Pollution during operation – air quality is set to sometimes: this is considered as a direct link between the air pollution and management. This is done in tunnels (by measuring the air quality the ventilation is modified) and by the constant measurement of air-quality, related to the expected weather-conditions to reduce the maximum speed limits. The second is an overall-measurement and is not something that is taken into account when designing a project.

3.3 Social aspects

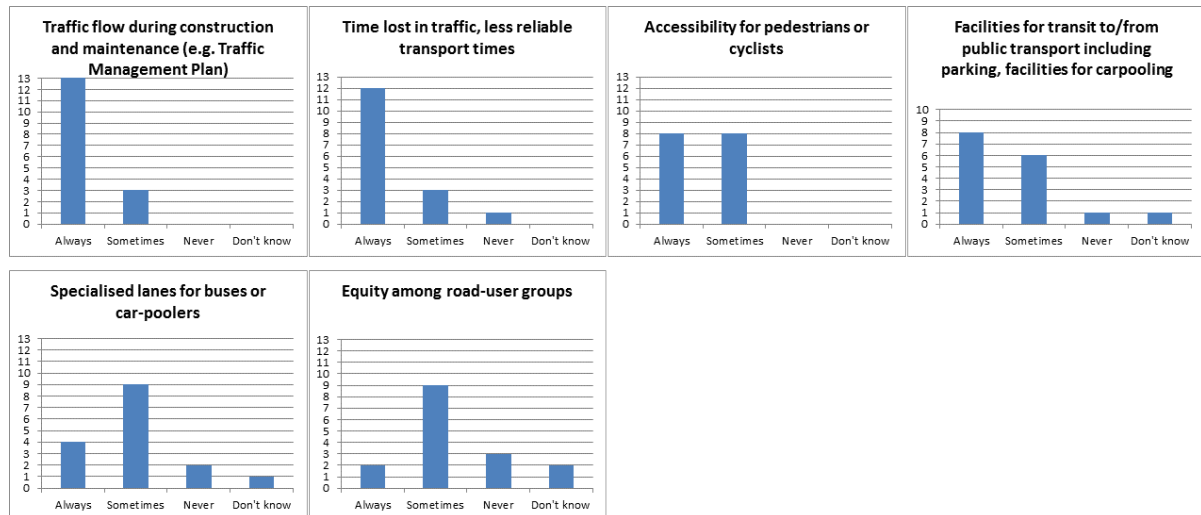
3.3.1 Cultural values

Cultural values are always regarded by one third of the NRAs and sometimes by the other two thirds.



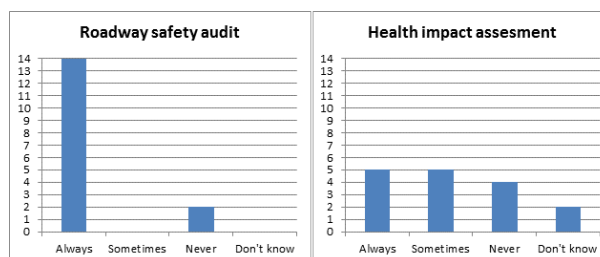
3.3.2 Mobility and accessibility

Almost all of the NRAs who responded take into account traffic flow during construction and transport. Half of the NRAs always consider accessibility for pedestrians and cyclist and the possibilities for transit to other types of transport. The other half, only sometimes pay attention to these aspects. Specialized lanes and equity among road users are topics to which less attention is paid.



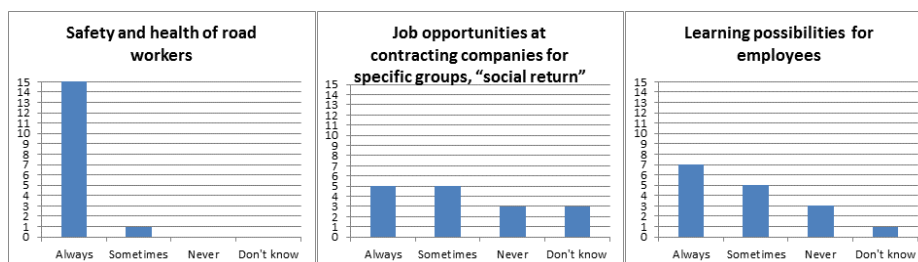
3.3.3 Safety

Almost all NRAs always perform a road safety audit; only two NRAs said that they do not. A health assessment is not regularly carried out: receiving equal scores for all three answer options.



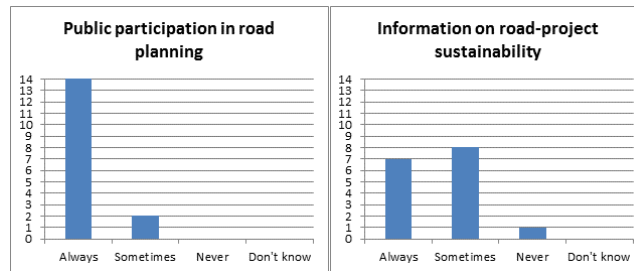
3.3.4 Labour

Safety and health of road workers is considered by all NRAs (this might be as a result of legal requirements). However, the attention paid to social return is very different amongst the NRAs, with almost an equal split of respondents saying always, sometimes, never and don't know. Education is always considered of by half the NRAs, while the others pay less or no attention to it.



3.3.5 Communication

A large majority of the NRAs always pay attention to public participation during the planning process. However, the provision of information on sustainability of road project is mostly done in pilot or specific cases, being a standard procedure for only half of the NRAs.



3.3.6 Comments regarding social questions

Respondents were also invited to provide additional comments. The following comments were made by the respondents:

- In terms of social impacts although we don't carry out Health Impact Assessments we are supportive of local health authorities who need to do these and we provide relevant data to those bodies.
- In terms of public participation we have highly regarded approaches to consultation but this does not amount to participation in road design and this remains a rare outcome.
- Mobility, Q 6: Not sure what you mean.
- Safety Q 2: Not sure what you mean.
- Safety Q2: (a question mark was posed by one respondent for “sometimes”).
- Mobility, accessibility – equity among road-user groups is considered as positive discrimination to the weaker road-users and so set to always.
- Labour – learning possibilities for employees is discussed as the possibilities in our own NRA, where there are a lot of possibilities. This is not something that is mandatory or specially requested for constructors.

3.4 Other sustainability aspects

The questionnaire also provided the option to suggest sustainability aspects that were missed in the questionnaire. This resulted in the following suggestions.

- Climate change adaptation.
- Please have a look at our sustainability report:
http://www.asfinag.at/c/document_library/get_file?uuid=a8dc3d2f-6f11-456e-a903-294d6ffc2860&groupId=10136.
- Child impact assessments.
- Use of chemicals and dangerous substances.
- The 4-step principle (free translation: 1 re-think, 2 optimize, 3 re-build, 4. Build new.)
- Biocide reduction program.
- Green public procurement – our NRA endorses the European GPP-criteria with a 100% goal of sustainable public procurement in 2020.

4 Open questions

4.1 Questions and responses

1. What are the ambitions of your organization with respect to sustainability? (you can also send a link to a specific section of the website of your NRA)

- Our mission statement is to “improve quality of life and national economic competitiveness by developing, maintaining and operating the national road network in a safe, cost effective and sustainable manner.”
- Sustainability is part of our vision and must be implemented through our activities.
- Our high level ambitions are set out in our Strategic Plan 2010-15 which can be seen here <http://www.highways.gov.uk/aboutus/25917.aspx>. And in more detail through our Sustainable Development Action Plan 2012-15 which is here: <http://www.highways.gov.uk/aboutus/33752.aspx>
- Please refer to our Sustainability Report, p. 16 ongoing http://www.asfinag.at/c/document_library/get_file?uuid=a8dc3d2f-6f11-456e-a903-294d6ffc2860&groupId=10136.
- The three pillars are worked with separately. The social and economic parts are not often referred to as 'sustainability'. The word is more related to environmental issues. There is no decision on e.g. CSR-labelling.
- "Environmental policy of the Agency is based on 7 strategic goals:
 - 1) environmental management system
 - 2) reduction of the ecological footprint
 - 3) conformity with environmental law
 - 4) promotion of biodiversity in operations and investment
 - 5) management of products, materials and waste
 - 6) public policy expectations
 - 7) environmental communication and information.

The policy of main public organizations, governments, sectoral associations known as Via 2020 (Vlaanderen in Actie – Flanders in action) is addressing to improve life quality focusing on several main goals to be achieved by 2020:

- 1) reduction of dust (PM10) by a quarter relative to 2007
- 2) being among the European top regions with the least traffic accidents and casualties
- 3) improving quality of water, air, soil, and reduction of noise
- 4) reduction of emissions and climate policy
- 5) improving biodiversity by habitats and preservation measures.

Green public procurement – our NRA endorses the Flemish ambition of 100% sustainable public procurement in 2020 (Vlaams actieplan duurzame overheidsopdrachten)".

- It is high and we are presently working on Environmental aspects, Global climate changes, noise, CO₂ emissions and LCA.
- Alignment with the Scottish Governments ambitions for sustainability as defined in the Government Economic Strategy, particularly with respect to the low carbon agenda.

- RWS has high ambitions and wants to be a leading public client in sustainability (see <http://www.rijkswaterstaat.nl/kenniscentrum/duurzaam/index.aspx> and see also <http://www.duurzaamgww.nl/>).
- In the future.

2. Is there a preference at your NRA to assess sustainability performance through a quantitative or through a qualitative process? Or is a combination used?

- A combination of quantitative and qualitative processes are used.
- Combination.
- Both.
- We use a combination. Progress against the Sustainable development plan is measured both quantitatively and qualitatively. We are bound to report quantitatively against greening government commitments <http://sd.defra.gov.uk/gov/green-government/commitments/>. We also report only quantitative measures in the corporate performance report and this is done to treasury reporting guidelines.
- We use GRI for reporting our efforts.
- Both, depending on aspect. Safety: number of death and seriously injured. Environmental: more quality aspects.
- A combination of both is used.
- It is a combination.
- We undertake strategic environmental assessments and environmental impact assessments on a number of our schemes. The measurement of the implementation of mitigation is a combination of qualitative and quantitative.
- Quantitative where possible, qualitative where needed. In general a combination is used in the different phases of a road. Also depending the role and responsibilities of different partners. (In the planning phase instruments as environmental impact analyses, . in a contractual situation we apply a quantitative instrument like dubocalc and a more qualitative instrument as the CO₂ performance ladder).
- No preference.

3. Please describe the “best practices” in your organization with respect to the assessment or the increase of sustainability of roads. Please mention if these “best practices” are implemented in many or few projects in your organization.

- "The NRA Statement of Strategy 2007–2010 document follows this ‘sustainable’ mission by identifying the following targets:
 - Reducing greenhouse gas emissions associated with road transportation and construction.
 - Providing a road network that facilitates modal shift objectives.
 - Protecting the natural environment and cultural heritage.
 - Supporting and promoting best practice procedures on the integration of transportation and land use planning.
 - Introducing innovative construction methods, materials and operating practices, so as to reduce energy consumption.

In achieving [this] objective, [the NRA] will:

- Further enhance the attention given to environmental issues for national road projects by developing an Environmental Operating Plan.
 - Reduce greenhouse gas emissions per journey by reducing congestion.
 - Enhance the attractiveness of coach and bus services to the public through the provision of a road network that offers shorter and more reliable journey times.
 - Disseminate information found at archaeological investigations on road schemes so as to promote awareness of our cultural heritage.
 - Participate in the planning process, taking account of national road network considerations and the need to promote the integration of transportation and land use strategies.
 - Commence a pilot Reduced Energy Input program to save energy in the construction and operation of road schemes.
 - Undertake a research program to underpin our prediction methodologies and our overall approach to the integration of environmental issues into national road scheme development. "
- Use of standardized specifications for all road projects. These specifications are mainly focused on standardization and quality.
- We have a number of tools that all contribute such as Environmental impact assessment, Equality Impact assessment, road safety audits, non-motorised user audits, Appraisal guidance (WebTAG) etc. Our design standards increasingly favour sustainable solutions. We assess the success of projects using Post Opening Project Appraisal tools.
- We implemented some sustainability goals into our strategy. Please refer to our Sustainability Report, p. 18 and ongoing.
- Environmental targets (national and specific within the organisation that is followed-up). Technical and environmental requirements and guidelines. Actions plans with measures. Specific goals for the district (e.g. energy efficiency).
- (I think you need to make interviews for a question like this. I don't know how to answer.)
- Assessment of the effects of certain public and private projects on the environment (85/337/EEC). This legislation is always implemented on the projects that meet the relevant criteria. A Pavement Management System is purchased.
- I believe that we are not that far that we have best practices. We are working with the aim that it shall be implemented as a general tool and requirement.
- We have started to utilise CEEQUAL on some of our major projects. We operate Pavement Forum with our supply chain which has a sustainability element built into the Terms of Reference. We have a basic review of sustainability built into our value for money process for maintenance schemes.
- RWS is already for decades involved in increasing the sustainability of our works. For roads best practices can be named like:
 - Environmental impact assessment (all projects)
 - Measures to compensate and mitigate ecological degradation due to road construction (all projects)
 - Life cycle cost management
 - Reuse and recycling (99% of all "stony" waste and by-products is reused)

- Introduction of low temperature asphalt (increasing)
- Noise reducing pavements (porous asphalt)
- Design for recycling
- Dynamic lighting, use of LED technology for road and tunnel lighting
- Ecological management of verges and soft shoulders
- The construction of ecoducts (~25)
- Catchment and drainage of rainwater
- Use of a LCA based tool (DuboCalc) in green public procurement
- Use of CO₂ performance ladder in green public procurement
- We have no best practises.

4. Are there any tools or instruments available in your organization to assess the sustainability of a road project? (A list of requirements is also seen as a tool.) If yes, continue to Question 5, otherwise move to Question 7.

- Nine answered “Yes” and six answered “No”.

5. Please give the name and a short description of each tool your organization uses to measure sustainability.

- We have developed our own system based on Greenroads.
- Effekt.
- Although not formally called a sustainability tool our project appraisal tool, WebTAG <http://www.dft.gov.uk/webtag/> is the nearest thing we have to a comprehensive sustainability assessment tool.
- In addition we have a carbon calculation tool which also provides us with information on material use and recycling rates and even now water use.
- Construction of new roads: EIA. Every 2nd year: energy balance construction of junctions: ESA (expanded strategic analysis).
- Energy consumption (high voltage) is monitored by the invoices.
- CO₂-tool “Carbon Free-Ways”: a tool for calculation CO₂-emissions for road projects (currently in pilot phase, project is postponed).
- Balanced score cards measures reachability, safety.
- We have in general an environmental blueprint done before the constriction phase where the community is involved.
- Carbon Management System (see Transport Scotland website) and also CEEQUAL
- DuboCalc: a LCA based instrument to calculate the environmental cost indicator (ECI) of alternative infrastructural designs. Based on 11 environmental indicators and shadow costs this adds up to one “value”, the environmental cost indicator. In an economic most valuable bit approach the contractor with the lowest ECI is rewarded. See attached document, see also <http://www.youtube.com/watch?v=cAaL4FfBQNc&feature=relmfu>
- CO₂ performance ladder: see attached document, see also www.skao.nl
- The “omgevingswijzer”. An instrument to create a balance between people, planet and profit. Instrument to be used in the early stages of planning and design.(see attached document (in Dutch at this time)). Links 12 themes related to sustainability to each other and in this way helps decision making.

- Next specific requirements are used in contracts: requirements on the use of sustainable timber, social return on investment, child labour, use of recycled materials, legal requirements as noise, air and ground and ground water pollution, safety, mitigation and compensation of habitat and ecology, cultural and archaeological prerequisites. Minimum national criteria for sustainable purchasing. (attached) but these are already standard procedures in our works.

6. What are the performance indicators used as output of the tool(s) described in question 5? (Example: for a CO₂ footprint tool, the performance indicator is the amount of CO₂ emissions in a project.)

- CO₂ is based on regional impacts.
- JouleSave is used to assess energy impacts from Roads.
- Net Present Value, CO₂.
- WebTAG reports across a range of economic, social and environmental indicators.
- The Carbon calculation tool enables us to understand our carbon footprint and also the principal materials on which we depend.
- EIA: various indicators, depending on project Energy Balance: kWh, to GHG, etc.
- ESA: economic benefit, road safety parameters, impact in various aspects.
- CO₂ emission of a project.
- MWh energy consumption of the road installations.
- Noise levels along roads.
- For balanced score cards: a copy of this can be provided in Dutch only - for the air quality, please visit the website for more information.
- It is presently more related to some quantitative evaluations of the impact on the environment - however it is the aim that environmental KPI's will be implemented in the asset management system.
- For the CMS, the indicators are Embedded Carbon, Operational carbon such as Scope 1 and 2 energy use (e.g. fuels for building, site and transport).
- Protection of ground water, impact of noise protection (both at network level).

7. What are the research or development needs for assessment methods for sustainability according to your organization?

- Research need to focus on metrics related to social impacts.
- We need easy and inexpensive assessment methods.
- We haven't identified a need for R&D into further assessment methods.
- In 2012 / 2013 we will start to document and calculate balances of materials used for construction works.
- Hopefully the methods to be developed by SUNRA. We are testing CEEQUAL. Another project are developing methods to consider 3 environmental aspect* in planning, construction, declaration. (*Use of chemicals, climate/CO₂ impact and biodiversity). Beside this we have a number of LCA- and LCC-related projects. Personally I think we would benefit from a common European tool. The development of different tools and methods are running across each other where all actors (consultants, contractors etc.) will soon present their tool. Not very good for us who have to choose. When we wrote the ERA Net program 'Energy' we presented what we need and then we picked the SUNRA project for doing this.

- A general sustainability calculation tool (like DuboCalc in the Netherlands).
- A system for ranking contractors with regards to their CO₂-emissions (like the “CO₂-ladder” in the Netherlands), stimulating investments in sustainability.
- We need more focus on establishing models that can function with already existing prioritization models and KPI.
- Various strands of research on drainage (flood), air, noise emissions etc.
- Modelling of effects on sustainability factors (e.g. how can we reduce CO₂ by using different paving materials).
- All-in-one solution (method, tool) for assessing sustainability.
- Universal quantitative tools for aspects such as materials and energy.
- There is a need for harmonisation on a European level to prevent re-inventing the wheels that later will not match other wheels.

8. Are there any other aspects related to sustainability of road projects which have not been addressed in the previous questions?

- We are developing guidance on the impact of roads on wellbeing. Not sure this has been brought out in this questionnaire.
- The actual need for sustainability assessments, when and why.
- Water quantity: the runoff of rainwater from roads is often causing flooding of rural regions; the collection and local infiltration should be more considered, relative to de climate change problem.
- The vast relation between urban and suburban development.
- Community benefits and the social inclusion / employability agenda.
- The social aspects need to be more incorporated. The “omgevingswijzer” aims to incorporate this aspect also.

9. General or specific comments:

- I hope you are aware of the problem with questionnaires. It's not easy to answer all questions.
- The DGBC is still in the process of developing an assessment manual for sustainable infrastructure based on BREEAM.
- Many instruments are available and are being used. These instruments are to be used on a national level, so not only on RWS level.
- We are in different stage of development than other EU members also RWS, concerning quality of road network and its sustainability.

4.2 Analysis

1. What are the ambitions of your organization with respect to sustainability? (you can also send a link to a specific section of the website of your NRA)

Almost all NRAs indicate that they have specific ambitions with respect to sustainability. Some of them refer to the three pillars economic, environmental and social. Each country shows their own specific focus, however reoccurring topics include:

- Carbon footprint/climate change.
- LCA or other forms of environmental footprinting.

- Emissions (other than CO₂).
- Cultivating natural heritage.
- LCC or other cost effective strategies.

2. Is there a preference at your NRA to assess sustainability performance through a quantitative or through a qualitative process? Or is a combination used?

Most NRAs indicate that they use a combination of qualitative and quantitative tools. Some state that there is a preference for quantitative tools, but that this is very often not possible.

3. Please describe the “best practices” in your organization with respect to the assessment or the increase of sustainability of roads. Please mention if these “best practices” are implemented in many or few projects in your organization.

Not all NRAs are able to describe best practises. Some NRAs state that they do not have best practices at all. Many NRAs say that they work with specific targets or aims that should be included, met or fulfilled. The described methods include:

- Environmental impact assessment.
- Equality Impact assessment.
- Road safety audits, non-motorised user audits.
- Appraisal guidance (WebTAG) etc.
- Design standards that increasingly favour sustainable solutions.
- Assessment of success of projects using Post Opening Project Appraisal tools.
- Assessment of the effects of certain public and private projects on the environment (85/337/EEC).
- Introducing a Pavement Management System.
- CEEQUAL.
- Operate Pavement Forum with our supply chain which has a sustainability element built into the Terms of Reference.
- A basic review of sustainability built into our value for money process for maintenance schemes.

4. Are there any tools or instruments available in your organization to assess the sustainability of a road project? (A list of requirements is also seen as a tool.) If yes, continue to Question 5, otherwise move to Question 7.

Nine answered “Yes” and six answered “No”.

5. Please give the name and a short description of each tool your organization uses to measure sustainability.

Most of the NRAs are using tools developed in-house. Many of the tools focus on CO₂ output, however sometimes other aspects are also taken into account, often based on some kind of environmental impact assessment. Many of these tools seem to be not fully developed but still undergoing improvements.

6. What are the performance indicators used as output of the tool(s) described in question 5? (Example: for a CO₂ footprint tool, the performance indicator is the amount of CO₂ emissions in a project.)

The indicator used was often CO₂, but also sometimes kWh and aggregated (environmental impact) value is used or strived at in the tools.

7. What are the research or development needs for assessment methods for sustainability according to your organization?

The NRAs are expressing a wide variety of research needs. For example, one describes the need for better tools to measure social impact, while another describe the need for better flood, air and noise models. Some NRAs specially indicate that easy tools are needed, preferably harmonised across Europe. There are also a few NRAs which did not answer this question.

8. Are there any other aspects related to sustainability of road projects which have not been addressed in the previous questions?

The following issues were missed in the questionnaire:

- The impact of roads on well-being.
- The actual need for sustainability assessments, when and why.
- Water quantity: the runoff of rainwater from roads is often causing flooding of rural regions; the collection and local infiltration should be more considered, relative to de climate change problem.
- The vast relation between urban and suburban development.
- Community benefits and the social inclusion / employability agenda.
- The social aspects need to be more incorporated.

9. General or specific comments

The following general comments were made:

- It wasn't easy to answer all questions.
- Many instruments are available and are being used. These instruments are to be used on a national level, so not only on a NRA level.
- NRAs in different countries can be in very different development stages concerning quality of road network and sustainability.

5 Conclusions and recommendations

5.1 Summary of responses

In total, 17 NRAs responded to the majority² of the questions, and a fairly good share of European countries was represented.

The responses showed the following trends with respect to sustainability in general:

- All NRAs have formulated an ambition with respect to sustainability. Not all countries have an integral approach including economic and social aspects in their sustainability concept; some consider sustainability only as concerning environmental aspects. However, there is a request from several respondents for development of an integrated and broader approach of sustainability including aspects of all three pillars.
- European countries differ greatly in extent to which sustainability is implemented and how this is done.

The aspects that are taken into account vary between countries. However, there are some aspects that are considered in most of the countries (9 or more out of 16/17 NRAs²) and these are:

- Cost benefit analysis (CBA) or other economic assessment
 - Pavement life time or management systems or alike
 - Requirements on the environmental profile of the contractor
 - Noise-impact, during construction and operation
 - Air quality, during construction and operation
 - Water quality, during construction and operation
 - Light pollution, during construction
 - Road-construction materials
 - Energy for road operation and maintenance
 - Use of recycled materials
 - Waste management
 - Biodiversity, habitat restoration, compensatory measures, connection of habitats across roadways, etc.
 - Sustainable roadside vegetation
 - Traffic flow during construction and maintenance
 - Time lost in traffic, reliability of transport times
 - Roadway safety audit
 - Safety and health of road workers and
 - Public participation in road planning.
- For six aspects, a majority (9 or more) of the respondents answered “sometimes”. This, including the previous conclusion, shows that most of the mentioned sustainability aspects are included “always” or “sometimes”.

² 15 parties responded to all questions, 1 responded only to the multiple choice questions and 1 only to the economic and environmental part of the multiple choice questions.

- Only one aspect was mentioned as “never” taken into account by most countries (10 from 17, of which 4 did not know): the urban heat island effect.
- Two thirds of the respondents say they have tools or instruments available to assess the sustainability of a road project.
- Many countries are developing their own tools that assess CO₂ footprint and sometimes include other aspects, like an aggregated (environmental impact) indicator. Many of these tools seem not yet to be fully developed and still undergoing improvements.
- Several of the respondents stated that social aspects are currently underrepresented in sustainability tools.
- More (European) harmonisation and integration of different aspects is seen as useful by many NRAs.

5.2 Conclusions and recommendations

Generally, it can be concluded that all of the NRAs have formulated sustainability ambitions. However, the way in which they work out these ambitions, differs largely from country to country. The extent to which sustainability is worked out in national programmes is quite different amongst the European countries.

Most of the sustainability aspects that the NRAs were asked about are being considered “always” or “sometimes”. Several of the aspects are taken into account “always” for the majority (≥9). These include economic assessment, various kinds of environmental assessment (LCA, air quality, noise, waste management, biodiversity) and traffic & safety audits. Only one aspect was “never” taken into account by the majority: the urban heat island effect.

Two-third of the respondents have tools, often developed by themselves but also often still under development. CO₂ is the main indicator in many tools. Sometimes other aspects are included, for example an aggregated environmental impact indicator.

The respondents expressed either no need for further development, because they did not have much developed yet, or quite specific development needs. The identified needs are: better or more representation of social aspects, more (European) harmonisation and better integration of different aspects.

Appendix A: List of contributing institutions

Organisation	Country
ASFINAG	Austria
Agentschap Wegen en Verkeer (Flemish Regional RA)	Belgium (Flanders)
Public Service of Wallonia Operational General Directorate for Roads and Buildings	Belgium (Wallonia)
Danish Road Directorate	Denmark
Finnish Transport Agency	Finland
Sétra	France
Irish National Roads Authority	Ireland
Ernst & Young	Italy
Lithuanian Road Association	Lithuania
DGBC	Netherlands
Rijkswaterstaat	Netherlands
Norwegian Public Roads Administration	Norway
General Directorate for National Roads and Motorways	Poland
Transport Scotland	Scotland
ZAG (Slovenian National Building and Civil Engineering Institute)	Slovenia
Swedish Transport Administration	Sweden
Highways Agency	United Kingdom

Appendix B: Questionnaire on sustainability assessment of road projects

Sustainability for National Road Administrations [SUNRA]

Due to their role and size National Road Administrations (NRAs) have a big impact on society and the environment. Therefore NRAs play a crucial part in the implementation of sustainability development. NRAs increasingly seek instruments to assess the sustainability of their work. The ERA-NET ROAD project SUNRA aims to assist in this by designing a framework for a sustainability rating system for NRAs and for road projects. Such a rating system can promote sustainability performance of the NRA and its projects. It can also be used in national and external benchmarking.

For the research project SUNRA that aims to design a sustainability rating system, we are dependent on input from NRAs, the potential users of the system. Your participation in this questionnaire will give us essential information on current practice, best practices, good ideas and development needs across NRAs in Europe. We would therefore greatly appreciate your input which is of utmost importance to our work.

The word “sustainability” can be interpreted in many ways. In this questionnaire we choose a broad definition in order to make sure that we collect all sustainability initiatives. Following the Triple Bottom Line definition³, sustainability consists of three pillars comprising the economic, the environmental and the social aspects.

We kindly ask you to fill out the questionnaire below and to be as specific as possible. If you feel you are not able to complete the questionnaire, which is possible as this is a multidisciplinary field, please try and consult with your colleagues as they might be able to answer.

We ask you to include your e-mail address as one of the responses in the questionnaire. This will only be used in the context of this survey and specifically so that SUNRA researchers can seek further clarification of your responses. The results of the questionnaire will remain anonymous and we will not include names or contact details in the evaluation of the results. The overall result, without reference to specific respondents, will be communicated to all respondents.

Please respond on September 15 that the latest

The questionnaire has two parts. The first part comprises a series of multi-choice questions to get an impression of what aspects of sustainability are important to your organization. The second part comprises open questions where more details are asked on sustainability strategies and instruments currently used in your organisation. Besides this, there is room to indicate future ambitions and research needs to fulfil these ambitions.

Many thanks in advance for your cooperation,

Lennart Folkesson, VTI, Leader of SUNRA Work Package 3

Respondent details

Name of respondent (first name and surname):

Organization:

Respondent's function in the organization (e.g. project planning, maintenance, corporate management):

Functions of any colleagues having been consulted in answering the questions:

³ See: [John Elkington](#) (1997). *Cannibals with Forks: the Triple Bottom Line of 21st Century Business*.

General questions

Please indicate to what degree your organization considers each of the following aspects in its operations:

(Note: you can only choose one option; if your situation is in between two answers, please choose the most applicable, and use the comments bar at the end of the page for clarification if necessary.)

Sustainability Pillar	Sustainability aspect	Never	Sometimes ⁴	Always ⁵	Don't know
Economic					
	Life Cycle Cost (LCC), Total Cost of Ownership (TCO)				
	Cost/Benefit Analysis (CBA) or other economic assessment				
	Use of road tolls, economic incitements for road users, etc.				
	Pavement lifetime; Pavement Management System (PMS), etc.				
Environmental					
General	Environmental Management System (e.g. ISO 14001)				
	Life Cycle Analysis (LCA), Ecological Footprint, Carbon footprint or other environmental assessment				
	Environmental training for construction or maintenance personnel				
	Requirements on the environment profile of the contractor				
	Requirements on the environment profile of the suppliers				
Pollution during construction	Noise impact				
	Air quality				
	Water quality				
	Light pollution				
Pollution during operation	Noise impact				
	Air quality				
	Water quality				
	Light pollution				
	Urban heat island effect				
Natural resources	Water usage				
	Road-construction materials				
	Energy for road construction				
	Energy for road operation (e.g. lighting) and maintenance				
	Energy for traffic using the road				
	Use of recycled materials				
	Use of secondary materials				
	Waste management				
	Distances of material transport				

⁴ "Sometimes" indicates that this aspect is taken into account in specific selected projects or in pilot projects.

⁵ "Always" indicates that this aspect is subject to some type of requirement in all projects run by your NRA.

Nature	Biodiversity, habitat restoration , compensatory measures, connection of habitats across roadways, etc.				
	Sustainable roadside vegetation (e.g. low/no water vegetation, limited maintenance, use native plant species, etc)				
Social					
Cultural values	Promotion of art/culture/historical places/community values/local traditions				
	Scenery, vistas, tourist roads, etc.				
Mobility, accessibility	Traffic flow during construction and maintenance (e.g. Traffic Management Plan)				
	Time lost in traffic, less reliable transport times				
	Accessibility for pedestrians or cyclists				
	Facilities for transit to/from public transport including parking, facilities for carpooling				
	Specialised lanes for buses or car-poolers				
	Equity among road-user groups				
Safety	Roadway safety audit				
	Health impact assesment				
Labour	Safety and health of road workers				
	Job opportunities at contracting companies for specific groups, "social return"				
	Learning possibilities for employees				
Communication	Public participation in road planning				
	Information on road-project sustainability				

Comments (please refer to Sustainability Pillar and, where appropriate, specified sustainability aspect):

If your organization pays attention to other sustainability aspects than those mentioned above, please list them here:

.....

In order to obtain deeper insight in the use of sustainability instruments in your organization, we kindly ask you to answer the following:

Open questions

1. What are the ambitions of your organization with respect to sustainability? (you can also send a link to a specific section of the website of your NRA)
2. Is there a preference at your NRA to assess sustainability performance through a quantitative or through a qualitative process? Or is a combination used?
3. Please describe the "best practices" in your organization with respect to the assessment or the increase of sustainability of roads. Please mention if these "best practices" are implemented in many or few projects in your organization.
4. Are there any tools or instruments available in your organization to assess the sustainability of a road project? (A list of requirements is also seen as a tool.) If yes, continue to Question 5, otherwise move to Question 7.

5. Please give the name and a short description of each tool your organization uses to measure sustainability.
6. What are the performance indicators used as output of the tool(s) described in question 5? (Example: for a CO₂ footprint tool, the performance indicator is the amount of CO₂ emissions in a project.)
7. What are the research or development needs for assessment methods for sustainability according to your organization?
8. Are there any other aspects related to sustainability of road projects which have not been addressed in the previous questions?
9. General or specific comments: