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SUNRA - a sustainability rating system framework for National Road Administrations

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Abstract

National Road Administrations (NRAs) across Europe strive to improve the performance of their road networks. This improvement has been underpinned by significant research in the optimisation of road planning, design, construction and maintenance, which has enhanced the understanding of the social, environmental and economic aspects of managing a road network. Whilst there is common understanding in some aspects of sustainability there is not a common understanding of sustainability as a whole and thus how to benchmark and improve overall performance. The Sustainability: National Road Administrations (SUNRA) project aims to provide a common way of defining sustainability, identify how to measure sustainable development at a strategic level and integrate sustainable decision making into key intervention points. The project has developed a series of sustainability frameworks that allow NRAs to develop a tailored approach to sustainability based on national priorities, significant issues, stakeholder concerns and individual organisational structures.

Keywords: sustainability; metrics; indicators; environment; social; economy; impact; performance; sustainable; development; assessment; framework; road; project; design; construction

Résumé

L'administration routière nationale (NRAs) à travers l'Europe s'efforce d'améliorer la performance de leurs réseaux routiers. Cette amélioration a été soutenue par d'importantes recherches dans l'optimisation de la planification des route, la conception, la construction et l'entretien, ce qui a permis de mieux comprendre les aspects social, de l'ˇenvironnement et économiques de la gestion d'un réseau routier. Quoique qu'il y ait une compréhension commune dans certains aspects de la durabilité il n'y a pas une compréhension commune de la durabilité dans son ensemble et donc la façon de référence pour améliorer la performance globale. Le projet "Sustainability: National Road Administrations"(SUNRA) vise à fournir un moyen commun de définition de la durabilité, et d'identifier comment mesurer le développement durable à un niveau stratégique et intégrer les prises de décision durables dans les points 'intervention clés. Le projet a développé une série de cadres de durabilité qui permettent aux NRA de développer une approche adaptée à la durabilité en fonction des priorités nationales, les questions importantes, les préoccupations des intervenants et des structures organisationnelles individuelles.

Mots-clé: durabilité; métrique; indicateur; l'environnement; social; économie; impact; performance; durable; développement; évaluation; cadre; route; projet; conception; construction

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1. Introduction

National Road Administrations (NRAs) across Europe continually strive to improve the performance of their road networks. This improvement has been underpinned by significant research into the optimisation of road planning, design, construction and maintenance, which has enhanced the understanding of the social, environmental and economic aspects of managing a road network. These aspects form the three pillars of sustainability and are addressed at different levels across European countries through sustainable development plans and strategies. Whilst there is a common understanding of some aspects of sustainability this is not true of sustainability as a whole and thus measuring, benchmarking and improving overall performance can be difficult.

The ERA-NET ROAD II programme "Energy - Sustainability and Energy Efficient Management of Roads" is a trans-national joint research programme that is cross-border funded by the Road Authorities of Germany, Denmark, Ireland, Netherlands, Norway, Sweden and United Kingdom. This programme funded the 'Sustainability: National Road Administrations' (SUNRA) project, which has worked to develop a common understanding and means of measuring, benchmarking and improving sustainability performance of NRAs in Europe. The project was delivered by a partnership between TRL, VTI, CH2M HILL, TNO and DTU. The project was tasked with identifying how NRAs can contribute to sustainable development with three primary objectives:

1. To provide a common way of defining sustainability within the context of European NRAs.
2. To identify how to measure sustainable development at a strategic level and integrate sustainable decision making into key intervention points.
3. To develop a sustainability rating system framework that will enable NRAs to improve performance within the context of building and managing roads.

SUNRA developed three interconnected frameworks for NRAs to consider sustainability based on national priorities, significant issues, stakeholder concerns and individual organisational structures:

- Framework 1: helps NRAs define sustainability considerations at a strategic level, considering the level of influence they have; defining a commitment; and an implementation approach.
- Framework 2: is used to identify strategic sustainability metrics and performance levels applicable to organisational, programme and project level.
- Framework 3: provides a project level tool for scoping project level sustainability topics, selecting indicators, setting appropriate targets and recording results.

This paper demonstrates how the frameworks provide a common approach for NRAs to compare sustainability coverage whilst maintaining a level of flexibility that allows bespoke sustainability performance measurement for the particular needs of a road project. This paper focuses on the development and application of the three frameworks. The paper also presents the findings from the literature review and a European-wide survey of NRAs which assessed the current approaches to considering sustainability.

2. Approaches to sustainability in European NRAs

Defining sustainability

Numerous definitions of sustainability, sustainable development and sustainable transport have been proposed in policy and academic literature. However there is limited agreement on how valid any of the existing definitions actually are, how helpful it is to try to define 'sustainable transport' in the first place, and whether a common definition of it could ever be conceived (Nijkamp *et al.*, 2004). Choosing a definition raises some challenges as observed in previous research (Zietsman and Ramani, 2011):

- A definition of *sustainability* can be abstract and of little use without practical application.
- A definition of *sustainable transport* may support an illusion that transportation is a closed system that is sustainable in itself.
- A definition may be a compromise that includes conflicting elements. If these are not addressed the definition may not help the subsequent processes as much as hoped.
- A concise definition may omit essential principles and aspects of sustainability for ease of communication.

Hence NRAs need guidance on how to define sustainability in a way that avoid these pitfalls and is helpful in their national context. A useful starting point is to consider the fundamental relations between road transport and sustainable development.

Road transport systems consist of a number of components (infrastructure, vehicles, and road users) that interact to jointly produce movement and traffic. The operation of the road network (including construction, operation and maintenance) provides a range of positive services to society supporting its development and potentially its economic and social sustainability. However, road networks can also produce a broad range of negative pressures on the environment and society. The numerous positive and negative impacts, involving direct and indirect effects outside of the transport sector, mean the total contribution to sustainable development from transport over time is highly complex to establish.

These direct and indirect benefits and pressures are conceptualised as two levels of interrelationships – impact and influence. Impact refers to the impacts that NRA assets and activities have on environmental, social, and economic endpoints. Influence concerns how NRAs can create positive (or minimise negative) impacts, or otherwise foster change towards sustainability. This is conditioned by the resources, capacities and mandates an NRA has, as well as by the creativity, commitment and support it is able to mobilise. This second interrelationship is named influence, because it sees the NRAs as an actor with intentions and strategies, rather than as a mechanical cause and effect system (as in the first interrelationship).

A simplified approach which focuses on contributions from the road transport system to sustainability is recommended. A total of 27 categories of positive and negative impacts of road transport were identified from the literature, covering impacts to present and future generations distributed across the three pillars of sustainability. Since road transport is only one of the sectors contributing to each impact, it is not obvious whether specific 'sustainable' levels exist for each contribution to the impact. The contribution should be considered with regard to the desirable direction of change for the impact endpoint (increase/decrease), while special attention should be given to impacts where general critical limits are in jeopardy. Endpoints that may suffer large-scale, irreversible damage (such as climate change) are generally a greater concern from a sustainability point of view.

NRA goals and objectives

NRAs are not identical across countries in terms of their responsibilities, organisational structures or available delivery methods, not to mention their goals and objectives. The distribution of responsibilities to NRAs has also developed considerably over time (ECMT, 2004; PIARC, 2004). There is no common 'model' describing what exactly an NRA in Europe does, or how it does it. The predominant vision has been to bridge the gap between needs and satisfaction, by building and extending roads (ECMT, 1997). Lay (2009) presents an updated and wider scope for NRA responsibilities, including achieving financial efficiencies, meeting non-transport objectives for community welfare, the environment and sustainability and also in some cases vehicle and traffic regulation as well as multimodal responsibilities.

CEDR, the European Road Directors' organisation, emphasises the increasing role which NRAs have in reaching political goals set by governments placing road management within a broader framework of strategic and policy planning (Ingvarsson and Holmen, 2008; PIARC 2003). Currently goals most commonly include user safety, environmental improvements, increasing accessibility and mobility, and effective road management to ensure value for public money. At the strategic level, deliberations over issues like transport CO_2 emissions and public transport versus highway construction take place. Accessibility and landscape aspects are introduced at the planning and programming level, while more specific environmental impacts are dealt with at the project level.

NRA approaches to sustainability

The SUNRA team surveyed 22 European NRAs via a questionnaire to assess current practice in terms of sustainability. In total, 17 NRAs responded to the majority of the questions with a reasonable representation of European countries in terms of geography, size and road network maturity. The survey indicates that almost all have specific ambitions with respect to sustainability. However, not all countries have an integrated approach including all economic, environmental and social aspects. European countries differ greatly in the extent to which sustainability is implemented and how this is done. Whilst each country has their own focus there are commonly

recurring themes, including: climate change, greenhouse gas emissions, lifecycle assessment and other forms of environmental 'footprinting', air quality, noise, ecology, life cycle costs and cost effective strategies.

NRAs indicated that core environmental topics, such as air quality, noise nuisance and water pollution, are regularly considered, both during the operation of road infrastructure and during construction, whilst issues such as light pollution and the urban heat island effect are less frequently considered. Similarly for resource efficiency considerations, material specification, the use of recycled materials and waste management are frequently considered, whilst transport distances for materials are less frequently considered. All of the NRAs which responded indicated that ecology is a consideration for projects (either always or sometimes). With respect to the economic aspects of sustainability, whilst most NRAs use Cost Benefit Analysis, significantly fewer regularly consider lifecycle costs or the total cost of ownership. Fewer still regularly consider using economic instruments to impact upon the way roads are used, such as tolls. Whilst safety, journey time reliability and stakeholder consultation were all core considerations for NRAs, most other social considerations were not routinely considered, for example, equity among road user groups.

Metrics used by NRAs to measure sustainability performance

The literature review identified 270 metrics that were currently being measured by NRAs, demonstrating the wide range of data that is collected and reported. The study then attempted to rationalise the metrics in three stages. Stage One of the rationalisation reviewed the current metrics in use and identified those that were reported by more than one NRA; of these, 52 metrics were being reported by more than one country. Stage Two saw the metrics integrated with others, as recommended by wider research that had examined the gaps in what is currently being measured. Finally, Stage Three considered the rationalised list of metrics from Stage Two against the European Union (EU) sustainable development priorities, as set out in the EU Sustainable Development Strategy (SDS). The EU SDS has eight goals for sustainable transport; some of these goals have quantified targets associated with them and they are monitored and reported by EUROSTAT.

Generally combinations of quantitative and qualitative measures are used by NRAs to assess and report sustainability performance. Nine of the NRAs surveyed responded that they use a specific 'tool' to assess the sustainability of their road projects. The systems used are a mixture of tools developed specially by the NRAs and 'off-the-shelf' systems, such as CEEQUAL and were found to cover either a specific aspect of sustainability, such as greenhouse gas emissions, a range of environmental topics, or be more comprehensive in their scope.

NRAs are set up to deliver their strategic functions, with their current targets and metrics focused towards achieving this. From good practice case studies, we can see that integrating sustainability targets and metrics alongside other strategic metrics should be the major focus for implementing sustainability within the NRAs. However, case studies also demonstrate that actions are taken at different levels of organisations (board, programme and project) and this was an important consideration when developing the SUNRA frameworks.

The literature review, followed by a stakeholder workshop, enabled the prioritisation of metrics and the identification of 14 key sustainability topic areas. These 14 topic areas identified broadly align with the 11 sustainability goals recommended by the Transportation Research Board (TRB) Guidebook (TRB, 2011) aimed at helping transportation agencies (including NRAs) measure their sustainability performance. The SUNRA project used an expert panel to identify their key priorities from the metrics and measures identified. This produced a set of priority metrics and associated topic areas for consideration as the frameworks were developed. Gaps in what is currently being measured were identified and taken forward for consideration in the frameworks.

The prioritisation process resulted in a list of metrics that were considered to be a priority and also a list of those which were not. Where possible, the metrics that were selected for inclusion in the frameworks came from the priority list. Where there was a metric required that was not on the priority list, a suitable metric from the larger list was selected or one was taken from the TRB Guidebook. Where no suitable metric could be found, one was either developed by the team or it has been identified as a gap.

Need for a systemised framework to define and rate sustainability

European NRAs are at widely different positions in the adoption of a common understanding of sustainability. There are differences in the national policy priorities, the responsibilities and organisational features of individual

NRAs, the physical and economic conditions of the road network assets themselves and not least their own interests in making a strategic commitment to sustainability. Definitions of sustainability used by NRAs can be influenced by a wide range of sources including national ideas, visions and strategies for sustainable development, transport policy and assessment processes, stakeholder interests, their existing responsibilities, sectoral, national and international research as well as recognised definitions for 'sustainable transport'. This range of perspectives needs to be taken into account when developing and applying a framework for considering sustainability and requires a level of flexibility to enable it to be used by each NRA.

The literature review and survey of European NRAs demonstrates the need for a framework to aid the definition and scope of sustainability and also to help identify appropriate strategic targets and metrics. At a project level there is a need for a system to enable the measurement and rating of sustainability performance that is flexible enough to be applied to any European NRA.

The SUNRA project has developed three frameworks to address these needs. Figure 1 shows how the three frameworks are interconnected. The three frameworks enable NRAs to; 1) define sustainability in the context of the services that they deliver and the activities of their organisations and extended supply chains; 2) set appropriate performance targets, identify indicators, and; 3) measure and record their performance at a project level.

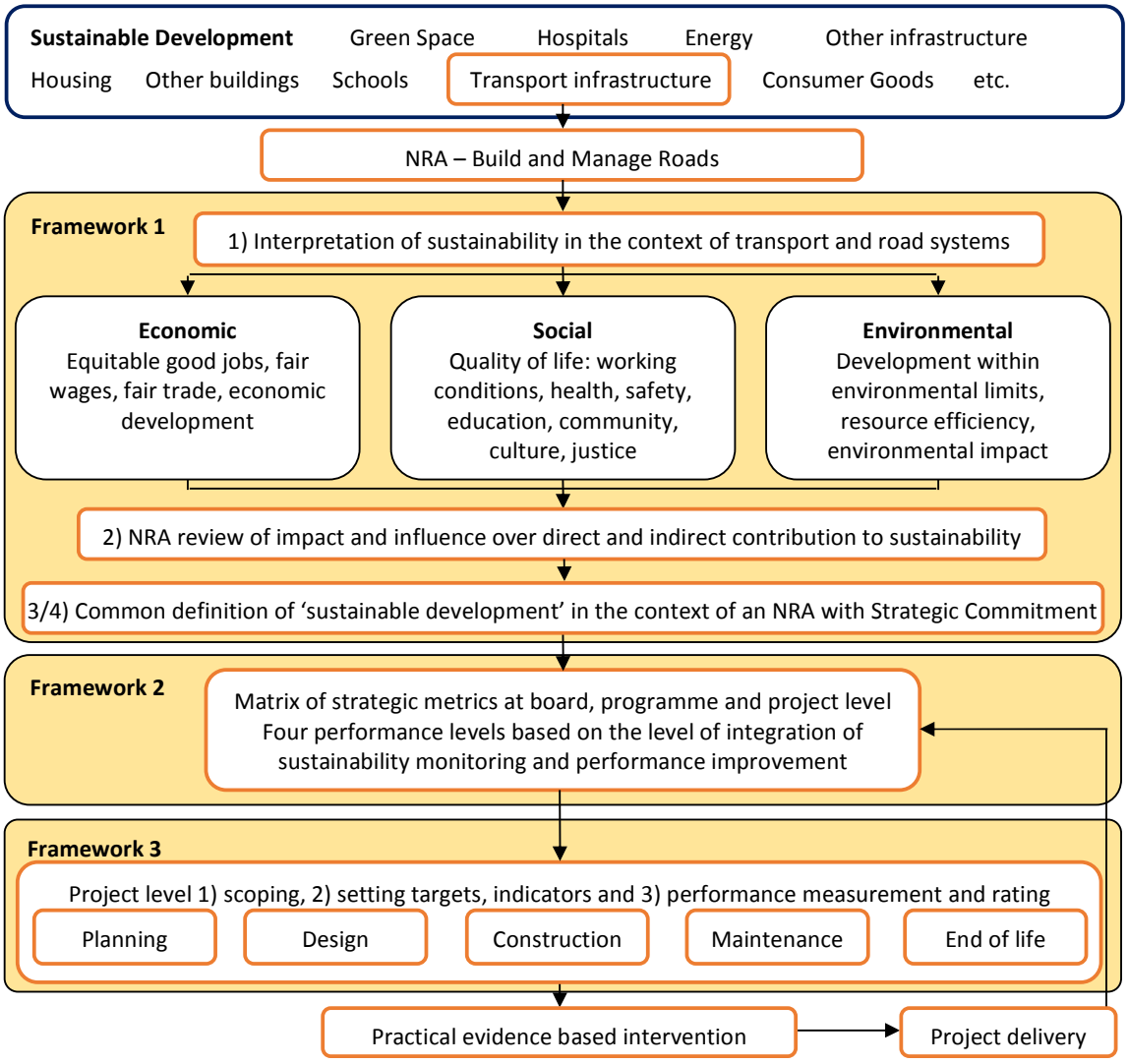

Figure 1. The three SUNRA frameworks

The first two frameworks developed by the SUNRA project enable NRAs to define sustainability and identify appropriate measures and metrics to assess their performance. The SUNRA frameworks sought to address the challenges identified through the literature review and stakeholder consultation (summarised in Section 2) through for example providing guidance on what to include in a definition of sustainability as a minimum, and how to apply and implement it.

3. Defining sustainability - SUNRA Frameworks 1 and 2

Framework 1
This is a document providing a practical four-step approach to help NRAs create and apply an appropriate definition of sustainability which can then frame its subsequent activities (ERA-NET, 2013a). This is needed because it is not appropriate to have a single definition of sustainability that all NRAs are expected to adopt. This is because context matters, in how sustainability should be pursued in the particular conditions and priorities under which each NRA operates, and considering what the NRA believes it can influence. These factors will be different in each country.

Framework 1 provides four steps that NRAs are recommended to take when defining sustainability. It suggests key elements to consider and proposes specific outputs to be delivered from each step.

Step 1: Interpretation of sustainability in the context of transport and road systems. In this step the NRA considers key existing definitions and principles of sustainable development and key ideas on how these relate to the context of its transport system and road sector. This helps the NRA appreciate the fundamental aspects of sustainability and how they apply to the NRA. It also helps the NRA adopt a scope and level of ambition for their sustainability efforts. NRAs may be more or less experienced in sustainability, and have different aspirations; consequently it is common for sustainability frameworks to adopt a tiered approach, with distinct levels of achievement or aspiration, this will be discussed further in Framework 2.

Step 2: Review of impact, influence and responsibility. In this step, the NRA should consider its more specific role in, and contribution to sustainability, taking into account impacts, influence and responsibility. This will include identifying impacts of main concern and reviewing the key contributions which the NRA can make to influence sustainability further, through mandates, resources, existing priorities and activities. Initially, it is recommended to consider the distinction between impacts, influence and responsibility. Impacts refer to effects on important receptors (individuals, communities, species or environmental features affected) due to NRA assets or activities. A positive impact may be conveyed by a service provided by the road transport system; a negative impact may be conveyed by a pressure arising from the transport system. Influence refers to how NRAs can create positive, or minimise negative, impacts or otherwise foster change towards sustainable development. This depends on the resources, capacities and mandates an NRA has, as well as on the creativity, commitment and support it is able to mobilise. Responsibility refers to the impacts the NRAs can influence, given their mandates and resources. Responsibility is something that may be assumed or negotiated rather than being an objective fact.

Step 3: Crafting a strategic commitment. In this step the NRA will formulate a commitment, based on the work undertaken in Steps 1 and 2, following the guidance provided in Framework 1.

Step 4: Implementing the commitment. In this step the NRA will adopt an action plan that details how the commitment will be communicated, including the strategy, next steps in its application and planned integration into relevant documents, procedures and activity areas.

Framework 2
This is a matrix of sustainability performance levels for managing and monitoring requirements at project, programme and board level. It is supported by example metrics at each performance and management level for 24 sustainability topics (identified either as priorities through the literature, workshop, or case studies) (ERA-NET, 2013b).

In order to ensure that NRAs with different levels of commitment and reporting capabilities can benchmark themselves against Framework 2, it is proposed that a tiered/staged approach is used for measuring performance. Framework 2 consists of four levels, with level one being the lowest and level four being the highest:

- Level 1: There is a commitment by the board to sustainability and the NRA is measuring and monitoring performance based on its current priority topics.
- Level 2: The NRA is developing a sustainability strategy and relevant policies. It is undertaking wider ranging measuring and monitoring covering additional sustainability topics and is starting to see improvements in performance, in relation to its priority topics.
- Level 3: The NRA has a sustainability strategy and policies in place. It is undertaking wider ranging measurement and monitoring, including topics that demonstrate the NRA's wider contribution to sustainable transport. It is seeing improvements in performance, in relation to its priority topics and other topics.
- Level 4: The NRA has a well embedded sustainability strategy and policies. It is undertaking comprehensive measurement and monitoring of a wide range of topics, to include those that demonstrate the NRA's wider contribution to sustainable development. It is improving performance year on year for a wide range of topics.

At the lower levels there is a focus on metrics that monitor the strategic functions of the NRAs, with the corporate and user metrics being introduced at the higher levels. The number of metrics reported at each level of Framework 2 increases, with those achieving level four monitoring the greatest number of metrics.

4. Measuring and benchmarking project performance – SUNRA Framework 3

Framework 3 is a spreadsheet based tool that has been developed to provide a rating system framework to assess the sustainability of road projects (ERA-NET, 2013c). The tool is applicable to various stages of the road-planning process. Where the framework is applied at the pre-design and design stages, the assessment should include sustainability considerations that cover all lifecycle stages of the road, i.e. construction, maintenance and operation and decommissioning (end of life).

In any planning situation, the decision-maker has to consider the need to meet various objectives and goals, such as national environmental objectives, social equity principles, regional development goals, local priorities of the municipality, corporate goals of the road administration and quality goals for the road project itself. With this in mind, Framework 3 has been designed to be flexible enough to operate within the constraints set by these objectives and goals. Likewise, Framework 3 is capable of functioning in parallel with management systems such as Balanced Scorecard, Pavement Management Systems, Environmental Management Systems, other ISO standards or other types of systems which may be used within an NRA.

The tool comprises three working steps:

- scoping aspects of each of the sustainability topics for inclusion in the framework,
- identification of indicators and targets for each aspect that has been scoped in; and,
- recording the performance against those targets.

Framework 3: Scoping

It is intended that the scoping stage is undertaken by the NRA based on its priorities and policies (having been identified using Framework 1 or otherwise established). This could be done once and applied to all projects and be subject to periodic review. Framework 3 includes 26 topics, jointly intended to represent a variety of aspects of the sustainability pillars, for which a number of key aspects have been described (topics include the Framework 2 topics and additional topics only relevant at project level). Scoping is based on sustainability considerations that cover all lifecycle stages, including construction and maintenance, as well as operating the road. For all topics, three standard scoping questions are included covering EU and national policy or legislation, NRA policy, and site-specific issues. Each topic aspect is equipped with a scoping question which will guide the user whether to include the aspect in the assessment or not. Within a specific topic, different aspects may thus be either scoped in or out.

For example, the "climate change mitigation" topic has scoping questions covering aspects such as road traffic emissions, operational energy, material specification and transport of materials and waste. The "noise and vibrations" topic has scoping questions covering construction working hours, the location of the site, road surface noise in operation and the construction techniques being employed. Scoping questions are designed to aid the user in determining whether a specific aspect is relevant to consider, for example by asking specific project location questions such as *"Is the project located close to sensitive properties that would be affected during construction*

or operation?" or questions concerning the type of project, for example *"Does the project present the opportunity to influence traffic emissions, e.g. through changes in topography, traffic flows, lane numbers or configuration?"*.

The scoping step enables NRAs to set the overall scope of sustainability topics to be considered to the specific needs of their project, organisation or national context in a systemised way through considering a standard and comprehensive set of scoping questions. This allows adequate justification to be given where certain topic aspects are scoped out from consideration.

Framework 3: Setting targets and identifying appropriate indicators
For each of the sustainability topic aspects selected for assessment, indicators and targets are identified. Whilst Framework 3 suggests relevant indicators and highlights relevant considerations for setting targets, it is up to the user to decide on these. Framework 3 is designed to encourage users to set targets and appropriate methods to record performance against those targets, including the means of collecting performance data.

Framework 3: Measuring performance
The final step is to record project performance against the target for each aspect. Performance is simply recorded as 'achieved', 'partially achieved' or 'target not met'. The scoping and target setting is intended to be completed at the design stage with the measurement of relevant targets applicable across the project lifecycle. It may be possible to measure performance for operational targets at the design stage, for example to eliminate operational energy through designing out the need for lighting and other energy-demanding equipment.

Pilot project example
Framework 3 has been piloted with four European NRAs during summer/autumn 2013. The following section describes the use of the framework on a motorway project in England. The project aims to increase capacity and reduce congestion by making use of the existing hard shoulder through installing traffic monitoring and signalling technology as an alternative to motorway widening.

Using the topics "Air Pollution", "Resource efficiency" and "Landscape and Ecosystem Health" as examples, the scoping stage of Framework 3 has been completed. Table 1 summarises the results of the scoping exercise against the three standard scoping questions and the set of scoping questions covering various topic aspects.

Table 1. Summary of SUNRA Framework 3 scoping for three example topics

Topic scoping aspect	Air pollution	Resource efficiency	Landscape and ecosystem health
EU or national legislation	Scoped in	Not scoped in	Not scoped in
NRA policy	Not scoped in	Scoped in	Not scoped in
Site specific issues	Scoped in	Not scoped in	Scoped in
Other topic aspects	3/3 aspects scoped in	2/5 aspects scoped in	0/6 aspects scoped in

The main source of data in answering the scoping questions was the non-statutory Environmental Assessment Report (EAR) as well as specific EU and UK legislation and NRA policy and targets, such as their national environment strategy.

"Air pollution" aspects have been scoped into the Framework both due to legislative requirements (setting out national limit values for air quality) and the requirement to assess air quality, for site specific issues as the project is within three nationally designated Air Quality Management Areas. For the topic specific scoping questions the consideration of traffic emissions, construction dust and construction plant emissions have also been scoped in as they have been included in the EAR as requiring assessment.

For the "Resource efficiency" topic, the NRA policy aspect has been scoped in due to their strategy target for a minimum of 25% of products used in construction to be recognised as responsibly sourced. Based on the materials chapter of the EAR, the use of recycled materials has also been scoped in as an aspect for assessment as well as the re-use of materials due to the potential for some existing gantries to be re-used for mounting the new

technology. However, overall raw material consumption, the durability of materials and water use have not been scoped in for consideration because the nature of the project does not require significant quantities of materials.

For the "Landscape and ecosystem health" topic, only the site specific scoping question has been scoped in due to the presence of specific visual receptors nearby. However, overall, because the scheme is entirely within the existing NRA boundary and requires no significant additional land-take, other aspects included in the scoping questions have not been scoped in. The specific topic aspects covered by the tool are not relevant to the scheme so the issues raised in the EAR, not covered by the tool, have been scoped in as site specific aspects, using this aspect as a catch all for other relevant aspects.

For each of the aspects scoped into Framework 3, a target has been set and indicators identified for measuring performance against the target. Table 2 summarises the example targets and indicators used.

Table 2. Summary of example targets and indicators

Topic: Aspect	Target	Indicator
Air quality: EU/ national policy & legislation	Design: No 'significant' air quality impacts as defined in IAN 174/13 and recorded in scheme EAR	Air quality model results
Air quality: Site specific issues	Design: No 'significant' air quality impacts as defined in IAN 174/13 and recorded in scheme EAR	Air quality model results
Air quality: Traffic emissions	Design: No 'significant' air quality impacts as defined in IAN 174/13 and recorded in scheme EAR	Air quality model results
Air quality: Construction dust	Construction: No recorded non-compliance or environmental incidents	On-site monitoring of compliance with EAR mitigation (via compliance with CEMP)
Air quality: Construction plant emissions	Construction: No recorded non-compliance or environmental incidents	On-site monitoring of compliance with EAR mitigation (via compliance with CEMP)
Resource efficiency: NRA policy	Design: Completion and approval of Materials Procurement Plan (MPP)	Production of MPP
	Construction: 25% of products from responsible sources (minimum)	Percentage of products from responsible sources
Resource efficiency: Use of recycled materials	Design & Construction: No recorded non-compliance with MPP	Compliance with MPP
Landscape and ecosystem health: Site specific issues	Design: No significant impacts on landscape features or visual receptors	Anticipated effects in the EAR
	Construction: no recorded non-compliance or environmental incidents	On-site monitoring of compliance with EAR mitigation (via compliance with CEMP and mitigation design drawings)

5. Conclusions

Due to the various contexts of European NRAs, the SUNRA Frameworks have not been developed with a prescriptive approach to defining sustainability but allow flexibility by providing a set of overarching sustainability topics and guidance for scoping topic aspects. The SUNRA Frameworks provide a practical approach to defining and measuring sustainability for an NRA. Framework 3 enables the NRA to define and record sustainability performance of a road project, drawing on existing processes and records rather than adding additional administrative burden. This one record of sustainability performance should prove useful to demonstrate to governments, stakeholders and the public an NRA's contribution to the sustainable development of a country. This is possible because Framework 3 is comprehensive enough to have full coverage of sustainability aspects, whilst flexible enough to be adaptable between NRAs and their projects in terms of the scope of aspects being considered.

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