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Highways England
Operational Metrics Manual

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1. Introduction

1.1 Why have an Operational Metrics Manual?

On 1 December 2014 the government issued its first Roads Investment Strategy (RIS), setting out a long-term vision for our motorways and major roads to improve the Strategic Road Network (SRN) and create better roads for users. The Performance Specification, part of the RIS suite of documents, sets out what government wants from Highways England over the course of the first Road Period from 2015-16 to 2019-20.

The Performance Specification sets out a number of performance measures that seek to focus Highways England's activities on meeting the needs of all road users and the country as a whole, maintaining a reliable and effective SRN that supports the economy while also contributing to wider environmental and social aims.

The performance measures are made up of a number of Key Performance Indicators (KPIs), supported by Performance Indicators (PIs) which give additional information on Highways England's performance. Some PIs are identified in the Performance Specification, while others have been identified and developed by Highways England. The Performance Specification also sets certain requirements, these may be for Highways England to develop a strategy or a new, more effective metric, or gather information on an issue.

It is important that we detail the mechanics behind how each of the indicators function. As such, this Operational Metrics Manual (OMM) will define, for each KPI and PI, how the data is collected, transformed and reported.

1.2 What is the Operational Metrics Manual?

The OMM details definitions for the measures identified in the Performance Specification in a series of technical notes, and sets out the parameters for measuring and monitoring performance against the KPIs. It also defines and gives a performance framework for the supporting PIs both in terms of providing clarity on SRN performance, as well as the improvement of existing and development of new measures for future Road Periods. This will ensure that Highways England focuses on delivering an effective SRN for now, while also working on continuous improvement over future Roads Periods. The OMM also sets out the requirements that are contained within the Performance Specification, and details ownership of these requirements.

In addition to the set of technical notes for the KPIs and PIs, the OMM briefly provides an explanation as to what we can expect within Highways England as we move to a performance based culture. The OMM sets out some of the roles and responsibilities that will be required to allow Highways England to report on its performance to the Highways Monitor and the Office of Rail and Road (ORR). The OMM will evolve over time as, for example, reporting processes change and improve, data-sets change or are enhanced, and methodologies vary. As such there is a change control process detailed in the OMM that will facilitate this.

While the OMM is owned by Highways England it has been produced in collaboration with the Department for Transport (DfT), and the ORR. The OMM has been through a series of iterations involving the ORR, DfT and internal Highways England specialists, to create a document that provides a basis for a common understanding as to how Highways England will report against its delivery of the Performance Specification.

1.3 Who will use the Operational Metrics Manual?

It will be primarily used by Highways England and the ORR to ensure that all performance measures and the associated methodologies are clearly understood. It is important to be clear what constitutes success or otherwise, how measures will be delivered, monitored, measured and reported, and who has responsibility for delivering on each KPI, PI or requirement. It is also important to understand how KPIs and PIs link across different areas of Highways England, so that partnership working ensures the best outcomes for all of the KPIs and PIs as a whole.

Two key roles have been identified within Highways England, which are the delivery managers and the accountable directors. Their responsibilities are set out below.

Delivery managers are responsible for:

- providing focal points with information that they request, ensuring it is reviewed for adequacy and accuracy. This is likely to involve populating performance information and commentaries, including monthly submissions for corporate reporting.
- where possible, escalating any performance issues, data quality issues (acknowledging delivery managers can identify but may not be able to influence data quality issues) or other issues, to focal points
- providing expertise on the KPI/PI, understanding the data sources, methodology, performance issues, and influences on performance
- responding to requests for information/intelligence from the Strategy & Planning directorate and Audit & Assurance, and providing ad hoc advice on the KPI/PI

- owning the KPI/PI technical note, which forms part of the OMM: reviewing it quarterly to ensure it is kept up to date, and following the change control process if any changes are required
- owning the KPI/PI reporting guidance note, ensuring it is kept up to date
- supporting the accountable director for KPI/PI delivery

Accountable Directors are:

- accountable for the delivery of their KPIs and PIs. While others may be responsible for contributing to the overall performance, the accountable director ensures that performance is ultimately delivered; and
- responsible for signing off regular reports / returns, specific to their KPI or PI, which are submitted to Highways England's Board in accordance with Highways England's governance and reporting arrangements for meeting the Performance Specification.

The document will be used by the ORR to deepen its understanding of the metrics, enabling more robust monitoring of Highways England's performance within the agreed parameters, performance measures and definitions as set out in the technical notes later in this document.

The OMM is owned by the Strategy & Planning directorate within Highways England. Any proposed amendments or queries to do with the OMM should be submitted to OperationalMetricsManual@highwaysengland.co.uk

1.4 How do you use the Operational Metrics Manual?

This OMM should be used as a regular source of reference for Highways England staff engaged in the delivery of the Performance Specification measures.

The OMM contains information that is relevant to particular KPIs and PIs, with additional information on how any KPI or PI links to other KPI or PIs. A standard technical note has been used for the information on each KPI and PI to try to make the document consistent across all areas. Each KPI or PI has a technical note, completed by Highways England specialists, and a template technical note, which contains associated guidance on filling it in, and is included as an annex for information (see Annex A).

The KPI and PI technical notes in this document set out in detail the parameters that define the indicators that will be used by Highways England and the ORR to measure and monitor performance of Highways England against agreed targets, where appropriate. They also allow the assessment of trajectories and ongoing improvement in performance where no specific target has been given. The technical notes are split into six sections as follows:

Narrative and Definition - gives the name and a brief definition of the indicator, and some narrative linked to the Road Investment Strategy (RIS).

Assumptions for Calculating Target – details any target or measure of success for the indicator. The 'measure of success' is often a literal description of an indicator's movement in a positive direction. For many of the indicators in the Performance Specification it was inappropriate to set a target (i.e. a measure of success) for Highways England, as many of the factors that influence the indicator's movement are not within Highways England's control. This is particularly the case for those measures associated with traffic flow and delay. (In the delay example, Highways England is required by the Performance Specification to act in a way that minimises delay as far as is possible). Also noted in this section are any assumptions behind the indicator, plus any internal and/or external influences on the performance of the indicator.

Risks – identifies risks to delivering the target or measure of success and any risks to successful reporting of the indicator.

Methodology – describes how the data behind the indicator is collected, any additional details on the indicator, how activities will be undertaken, and how measurement and reporting will demonstrate performance.

Reporting – describes when Highways England reports internally on an indicator.

Approval Process – sets out the delivery manager and accountable director for the indicator.

Interdependencies – Identifies the relationship and impact that the performance of one indicator can have on the performance of another. It may be that the relationship is a positive one – that the success of one indicator can help contribute to the success of another – or a negative one where there are tensions between two or more indicators. It is important that delivery managers and others involved in driving performance understand these relationships and work together to ensure the best way of delivering optimal outcomes.

2. A performance based culture

2.1 Performing in a monitored environment

Highways England now operates in a monitored environment that requires the continuation of some existing working practices, as well as the need to think and behave in different ways to adapt to this new environment. There are some key areas that must be understood about this new environment, namely:

- the focus on data quality and scoring,
- what to expect from the Highways Monitor, the ORR; and
- a complete understanding of any interventions on the SRN

2.2 Data quality and scoring methods

The ORR requires Highways England to score the quality of data used to measure and report against each objective, in order that Highways England understands more about the information used to support any decision making. The data score will be a qualitative assessment based on the reliability and completeness of collection, analysis and reporting techniques.

In providing the data quality score, Highways England should demonstrate that it understands the data process and its strengths and weaknesses. In particular, it is important in the early stages of the monitoring process that this understanding is demonstrated and communicated, more so than the score in itself. However, it is expected that this will lead to ongoing discussion about improving the data that is available to better understand Highways England's performance. Highways England does not have a mature data scoring system in place, and we will be working closely with the ORR to improve our methodology for evaluating data quality.

Allocating a data score will itself be a qualitative process that relies on the professional judgement of delivery managers, and the data owners they liaise with, fully understanding their area of expertise. Data scores should be accompanied by a commentary that justifies the scores in relation to the scoring criteria, explaining areas of strengths and weaknesses in the data quality. This should relate to and reference, where appropriate, the relevant risks and assumptions in the performance measure table. This should also inform ongoing development and improvement of data quality through, for example, improved collection and calculation methods, extending the scope of recording, using improved technologies and any other reasonable progressions.

The scoring system will have two components:

- **Validity** – which looks at the data collected, and is considered from the point where data collections starts, including supplied (third party) data, to the point just before it is processed to calculate the KPI or PI; and
- **Reliability** – which considers the reliability of the process used to take this data and calculate the KPI or PI value, for example, using automated programmes, which have been improved over time to remove errors. It also considers the checking process used.

Validity

Within validity there are two components to consider and score:

- Representativeness: does the indicator use all possible data (e.g. the whole of the SRN)?. If a sample is used, how representative of the entire population is it?
- Accuracy: correctness of the data collected i.e. is the data received accurate?

Score	Representativeness	Accuracy
1	>90% (Excellent)	>90% (Excellent)
2	70% - 90% (Good)	70% - 90% (Good)
3	50% - 69% (Average)	50% - 69% (Average)
4	30% - 49% (Below Average)	30% - 49% (Below Average)
5	<30% (Poor)	<30% (Poor)

Users need to assess their data and allocate it a score for representativeness and accuracy. The representativeness and accuracy are then aggregated into one overall validity score using the matrix shown in Figure 1.

If there is more than one data source which feeds into the KPI or PI, all the data sources should be assessed and individual judgement used to provide one overall representativeness and accuracy score. A commentary can be provided within the OMM technical notes explaining how delivery managers considered all the data sources in providing an overall representativeness and accuracy score.

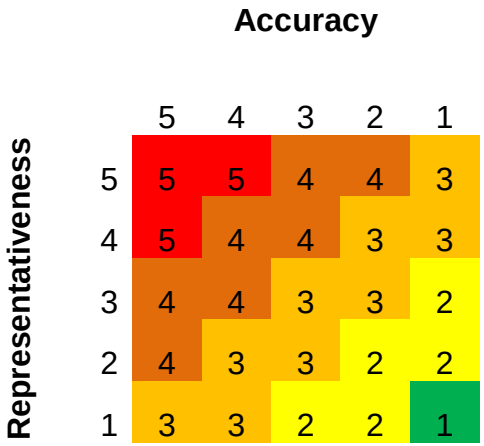

Figure 1. Overall level of validity

Reliability

The level of reliability is linked to the process applied in turning the raw data into the KPI or PI. Four bands have been defined:

Reliability Band	Definition
A	Process is sound and automated. Data owners are very satisfied with the process. Errors in calculation are minimal, and appropriate checks are carried out once the KPI or PI is calculated
B	Process is partially automated. Data owners are fully aware and satisfied with the process
C	Process is not automated and requires some manual intervention, yet checking can be done to ensure KPI or PI is reasonable
D	Process requires full manual interventions, checking is difficult, therefore KPI or PI validity is unknown

Alpha Numeric Score

Once delivery managers have determined a validity and reliability score, this should then be aggregated to provide an alpha numeric data quality score within the OMM templates, for example 1C or 2B.

2.3 The role of the Highways Monitor

The ORR has a legal duty under the Infrastructure Act 2015 to carry out activities to monitor the performance of Highways England in exercising its functions of operating the SRN in England, including the powers to require information it thinks is necessary to carry out this role. The ORR can require improvement plans to be put in place to address shortcomings in performance, and potentially levy fines. The OMM provides a structure for understanding how Highways England will report to the ORR in relation to the KPIs, PIs and requirements as set out in the Performance Specification for the first Road Period.

As outlined in the ORR's Monitoring Reporting Guidelines (http://orr.gov.uk/__data/assets/pdf_file/0018/20349/monitoring-reporting-guidelines-for-highways-england-for-road-period-1.pdf), Highways England is required to produce annual monitoring reporting statements by completing a series of templates, set out by the ORR, which include both annual and cumulative reporting. This will allow the ORR to make regular and consistent assessment of performance throughout the Road Period, and inform their annual assessment of operational and financial performance, to form an overall assessment of performance and efficiency.

The ORR has been engaged in the development of the OMM alongside Highways England and the DfT, to ensure performance against the indicators can be properly measured and reported. And also to ensure that the processes and reporting systems used to demonstrate performance is appropriate. Within this the assumptions, risks and mitigation, and methodologies around each measure demonstrate that Highways England understands its business, is making appropriate decisions, has the rationale and evidence to explain its decision making, and can understand the impact of the decisions and actions taken to improve future performance.

The ORR will not only be looking at performance, as described in an annual reporting statement produced by Highways England, but will also be looking further into trends in performance and in some areas will ask for forecasts of future performance. It will do this through understanding performance against key milestones identified in Highways England's Delivery Plan and other key programmes, as well as monitoring metric trajectories, so holding Highways England to account for the efficiency and predictability of delivery and the decisions that underlies it. Where there are areas of concern over any element of performance at any time during the reporting cycle, the ORR may instigate a programme of further investigation. More detailed information on the role of the ORR can be found in Highways England's operating licence, and the Memorandum of Understanding between the ORR and the DfT.

2.4 A complete understanding of any interventions on the SRN

Providing an increasingly comprehensive and well understood evidence base for network performance will be an important part of the decision making process for Highways England in the coming years and will be expected of us by the ORR. Having effective monitoring processes of key elements of network performance sit alongside historic performance data will enable the effects of any interventions on the network to be evaluated in more detail. It will be really important to understand exactly what any intervention expects to achieve, whether it meets that intended aim, and what if any other impacts are observed as a result. This will need to be combined with a longer term view of network needs and will help to make more focussed and effective investment decisions going forward.

3.Performance Specification - Key Performance Indicators and Performance Indicator Tables

Making the Network Safer

KPI: The number of KSIs on the SRN

Narrative: The RIS and Strategic Business Plan (SBP) outline the need for ongoing reductions in the number of KSI (Killed and Seriously Injured) casualties on the network, achieving an overall reduction of at least 40%, relative to the 2005–09 average baselines, by the end of 2020. This is equivalent to helping prevent over 2,500 unnecessary deaths or serious injuries on the Strategic Road Network (SRN). Highways England must report against this target, including variances to the trajectory, and evaluate and demonstrate how their activities have contributed towards the outcome.

KEY DEFINITIONS

STATS19 - the STATS19 Road Accident dataset includes any road accidents on the public highway in Great Britain, which is reported to the police and involves human injury or death. These accidents are recorded by police officers on a STATS19 report form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions) together with the vehicles and casualties involved and contributory factors to the accident as interpreted by the police. The form is completed at either the scene of the accident, or when the accident is reported to the police. The police receive training in how to complete the STATS 19 form, and also follow the guidance produced in STATS 20. The processing of the data is detailed in the section entitled 'Methodology – Data validation/cleansing'.

KSI - The defined severity of the casualty in road traffic accidents on the SRN is reported by the police where the casualty has sustained either a fatal or serious injury. The number of KSIs is reported retrospectively on an annual basis via the validated STATS19 data, which is released by the Department for Transport (DfT) at the end of June each year.

FATAL INJURY - Is defined as any human casualties who sustained injuries which caused death less than 30 days after the accident. Confirmed suicides are excluded from STATS19.

SERIOUS INJURY - Is defined as an injury for which a person is detained in hospital as an 'in-patient', or any of the following injuries, whether or not they are detained in hospital: fractures, concussion, internal injuries, crushings, burns (excluding friction burns), severe cuts, severe general shock requiring medical treatment and injuries causing death 30 or more days after the accident. An injured casualty is recorded as seriously or slightly injured by the police, on the basis of information available within a short time of the accident. This generally will not reflect the results of a medical examination, but may be influenced according to whether the casualty is hospitalised or not. Hospitalisation procedures will vary regionally.

BASELINE PERIOD - The baseline against which the 40% reduction will be measured is the average of the 2005 -2009 KSI figures. This supports the methodology taken from the National Road Safety Framework 2011.

2015 REFERENCED SRN -The definitive network, at 1 January 2015, against which casualty trends will be monitored. The network is referenced every five years, to take account of changes, as agreed with DfT.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	A reduction in the number of KSIs from the baseline figure of 2,321 to 1,393 by 31 December 2020. A +/- variance of 5% each year has been agreed with DfT Road User Safety Division to support this target.
Measure of success	Meeting or exceeding the target value by 31 December 2020. The value to be achieved by 31 March 2020 will be confirmed in due course.
Assumptions	• The completion of the investment programme as proposed as part of RIS / SBP. • We are assuming that we will receive some resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding guaranteed. • We will be increasing our partnership working. • Ongoing improvements in vehicle technology and medical advancements will contribute to the achievement of the 40% reduction in KSIs.
Organisational dependencies	• Effective scheme delivery in line with the investment programme as part of the RIS. This includes ring-fenced funding for safety. • Effective maintenance of the network infrastructure. • Effective incident management will result in fewer secondary incidents. This is likely to have a small benefit on KSI numbers. • Effective improvements to increase level of compliance i.e. roadworthy vehicles and drivers who obey the rules of the road. This is a significant dependency. • The cumulative effect of the above will contribute to the achievement of the 40% reduction in KSIs.
Government targets	The Strategic Framework for Road Safety (2011) provides an outline of national targets and the RIS 2015 – 20 and Performance Specification set out the requirement for a 40% KSI reduction target for SRN by 2020.
External influences	• Accuracy of the data provided to DfT by the police. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down as set out by ACPO (Association of Chief Police Officers). • Government policy and the resourcing of enforcement activity will have a significant impact on KSIs if the levels of police enforcement continue to drop. • Changes in levels of traffic and road speeds on the network, and developments within the automotive industry, could influence KSI numbers. • Highways England's ability to work more closely with partners to influence compliance and delivery of the Health and Safety 5 year plan. This document was published in September 2015, and includes

Field	Notes
	both road users and road workers. The Health, Safety and Wellbeing team is responsible for the road worker element of the plan, and will liaise with the Health Safety Executive (HSE), while the Safer Roads Group is responsible for road user safety. • The cumulative effect of the above will influence the ability to meet the target.

RISKS

Field	Notes
To meeting target	• Conflicting priorities for investment resulting in a lack of funding for schemes and initiatives which would contribute towards meeting the target. • Marketing and advertising restrictions – preventing intelligence-led initiatives and campaigns from being undertaken. • Reliance on other partners/stakeholders to fund/undertake initiatives and campaigns. • Improving performance will also require resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding. • The value management process does currently not incentivise prevention schemes – this may result in key schemes not getting funded. • HGV speed limits are increasing as at April 2015 – it is unclear the impact this may have, but it may increase the number of KSIs.
To reporting	• Reliance on the police to provide accurate data when they collect it at the accident scene. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70%. STATS19 and police reporting are covered by the Standing Committee for Road Accident Statistics (SCRAS). Highways England is represented on this group. • STATS19 data provided by DfT on an annual basis on the last Thursday of June each year, ie 1 January 2013 to 31 December 2013 data is not available until June 2014.

METHODOLOGY

Field	Notes
Unit of measure	KSIs (1 January to 31 December)
Type of data	Number of KSIs: supplied by STATS19 Road Accident dataset
Geographical coverage	2015 referenced SRN
Baseline period	Average of 2005 – 2009 data (DfT formula)
Baseline value	2,321 (2005-9 average). Highways England will produce annual trajectories based on previous years KSI numbers, to identify likelihood of 2020 target being met.
Historical data	STATS19 data available from 1994.
Methodology and calculation	*Data collection:* Road accidents on the public highway in Great Britain, reported to the police and which involve human injury or death, are recorded by police officers onto a STATS19 report form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions) together with the vehicles and casualties involved and contributory factors to the accident (as interpreted by the police). The form is completed at either the scene of the accident, or when the accident is reported to the police.
	Calculating the metric: The number of KSIs are calculated on an annual basis from the SRN data extracted from the DfT validated data. The number of KSIs is the sum of the number of fatal and seriously injured casualties. This information is compared to that of the previous years and against the 2005-09 baseline to monitor progress against the target.
Data collection frequency	STATS19 data provided by DfT on an annual basis on the last Thursday of June each year.
Validation/ cleansing	*Data collection:* The data recorded by the police on STATS19 is collated by the relevant local authority who undertakes an initial validation for their area. The data is then forwarded to DfT who undertake a further validation process for all UK data.
	Calculating the metric: Once the national data is released (annually), Highways England extracts the data for the SRN and plots it against the referenced network, enabling any discrepancies to be identified. The number of KSIs is calculated on an annual basis from the SRN data extracted from the DfT validated data. This information is sense checked and compared to that of the previous years.

Field	Notes
Data quality score	2C **Validity = 2** 1 = The number of Killed and Seriously Injured are correct and all are reported. There are no errors in this value. 2 = The data represents the entire SRN and there are no holes. However, as noted in the risks to reporting, police coverage and capability are a potential issue. **Reliability** The process is not automated and is therefore a C.

REPORTING

Field	Notes
Highways England reporting	In year KSIs is reported annually, at the end of June the following year (eg 2013 data is reported in June 2014).
Outside scope of assessment	There may be a requirement to capture and record KSIs which fall outside the referenced network, which is outside of the scope of this indicator. This information is captured on an annual basis.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Safety Action Plan Coordinator

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels may result in casualties, putting the target at risk.	Exact linkage is currently undefined.	No management is in place at this stage.
New and Upgraded Crossings KPI	New and upgraded crossings may result in a reduction in KSIs.	Exact linkage is currently undefined.	No management is in place at this stage.
Flooding PI	Decrease in the number of flooding hotspots may result in a decrease in KSIs.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Incident numbers and contributory factors for Motorways

Narrative: This indicator looks at incident numbers on motorways, as well as casualty numbers and contributory factors on motorways. This will help Highways England gain a better understanding of where incidents occur and determine how best to prevent them, which will contribute to the target of a 40% reduction in Killed or Seriously Injured (KSIs) by 2020.
Definition: This metric will be split into two parts, and this note will be split into two parts throughout:

a) Incident numbers for motorways, and
b) Casualty numbers and contributory factors on motorways

a) All motorway incidents are entered onto Command and Control database by Traffic Officer control room staff. The following filters are then applied to select incidents which enable the measure to be calculated and target performance ascertained:

- only incidents between 0600 – 2200hrs;
- only incidents where a physical closure has been recorded (based on closure codes); and
- Excludes weather events, roadworks, infrastructure defect, admin, monitoring and observation logs are excluded (based on final closure code).

A physical closure can range from a one lane closure to a complete motorway closure (both carriageways), but also includes a rolling block as this stops the traffic and a red X sign which tells motorists the lane is closed.

b) Casualties in road traffic collisions on the Strategic Road Network (SRN) are reported by the police where injury has been sustained. The number of casualties is reported retrospectively on an annual basis via the validated STATS19 data which is released by the Department for Transport (DfT) on the last Thursday of June each year. The annual report entitled 'Reported Road Casualties on the SRN provides a detailed breakdown of the data for the SRN, split by motorway and All-purpose truck road (APTR), which includes casualty numbers and contributory factors.
In addition, annual 'Operational State of the network Reports' are produced, which break down the validated STATS19 data to a regional level.

KEY DEFINITIONS
INCIDENT - incident types are broken down into breakdown, obstruction/debris, road traffic collision, and other on the motorway network.
CASUALTY - A casualty is defined as a person killed or injured in an accident. Casualties are sub-divided into killed, seriously injured and slightly injured.

CONTRIBUTORY FACTOR - STATS19 contains 78 factors which can be attributed to having contributed to a collision. The officer at the scene can attribute up to six factors to each collision. However, this is only the opinion of the reporting officer and therefore the actual cause of personal injury collision is only derived after the investigation by the police or coroner.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	a) To report on incident numbers. b) To report the number of casualties on the motorway network which will contribute to the KPI target of a 40% reduction in KSI casualties on the SRN by 2020.
Measure of success	a) A reduction in the numbers of incidents on the motorway. b) A reduction in the numbers of casualties on the motorway and monitor contributory factors for emerging trends that can lead to interventions to support casualty reduction.
Assumptions	a) Highways England are aware of an incident that impacts the motorway live lane(s) • The measure includes all incidents that the Traffic Officers Service is aware of or involved in, regardless of the level of response or attendance by Highways England. • Weather events, roadworks and administrative/observational logs do not impact the live lane are excluded from the measure to ensure the target is based purely on live lane impacting incidents. • Operations resource funding is maintained to fund staff at existing levels. • That there are no significant changes to the motorway network in terms of unexpected major infrastructure damage (eg bridge collapse). • That there are no significant changes to the motorway network caused by extraordinary natural phenomena (eg major flooding). • That no national emergency / terrorist events; pandemic; or national pandemics (eg avian flu); have a negative impact on the indicator. • Smart Motorways do not have a negative impact on the indicator. • Increase in roadworks will not have a negative impact on the indicator. • The vehicle recovery contract, which is due to be re-let during the first Road Period, continues with the same contract and conditions as currently. • Each incident is recorded and counted separately, therefore multiple incidents will be counted individually.

Field	Notes
	b) The completion of the investment programme as proposed as part of the RIS / SBP. • Resource funding is provided for partnership working to help change driver behaviour and compliance. There is currently no resource funding guaranteed. • An increase in partnership working. • Ongoing improvements in vehicle technology and medical advancements will contribute to the reduction in the number of casualties on motorways.
Organisational dependencies	a) Effective incident management. • Accurate recording of Command and Control data. • Traffic officer patrol strategies, including service coverage, may influence the number of incidents recorded. b) Effective scheme delivery in line with the investment programme as part of the RIS. This includes ring-fenced funding for safety. • Effective maintenance of the network infrastructure. • Effective incident management will result in fewer secondary incidents. This is likely to have a small benefit on casualty numbers. • Effective improvements to increase level of compliance ie roadworthy vehicles and drivers who obey the rules of the road. This is a significant dependency. • The cumulative effect of the above will contribute to the reduction of casualties and incidents on the motorways.
Government targets	a) N/A b) The Strategic Framework for Road Safety (2011) provides an outline of national targets and the RIS for the 2015/16 – 2019/20 Road Period Performance Specification sets out the requirement for a 40% KSI reduction target for SRN by 2020.
External influences	a) N/A b) Accuracy of data provided to DfT by the police. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70% as set out by the Association of Chief Police Officers (ACPO). • Government policy and resourcing of enforcement activity will have a significant impact on casualties

Field	Notes
	and incidents on the motorway network if the levels of police enforcement continue to drop. • Changes in levels of traffic and road speeds on the network, and developments within the automotive industry, could influence casualty and incident numbers. • Highways England's ability to work more closely with our partners to influence compliance and delivery of the Health and Safety 5 year plan. This document was published in September 2015 and includes both road users and road workers. The Health, Safety and Wellbeing team are responsible for the road worker element of the plan and will liaise with the Health and Safety Executive (HSE), whilst the Safer Roads Group are responsible for road user safety. • The cumulative effect of the above will influence the ability reduce the number of casualties on the motorway network.

RISKS

Field	Notes
To meeting target	a) All Lane Running Smart Motorways may increase the numbers of lane impacting incidents in some locations, because there are more live lanes. b) Conflicting priorities for investment resulting in a lack of funding for schemes and initiatives which would contribute towards meeting the target. • Marketing and advertising restrictions – preventing intelligence-led initiatives and campaigns from being undertaken. • Reliance on other partners/stakeholders to fund/undertake initiatives and campaigns. • Improving performance will also require resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding. • The value management process does currently not incentivise prevention schemes – this may result in key schemes not getting funded. • Heavy Goods Vehicles (HGV) speed limits are increasing as at April 2015 – it is unclear the impact this may have, but it may increase the number of casualties on the motorways.
To reporting	a) Reliance upon Operations Directorate to record accurate incident data - Note that an incident which involves a casualty will get recorded in both a) and b) of this metric Data is currently recorded on the Highways England command and control database, stored in the Roads Information Framework (RIF)

Field	Notes
	(HA Data warehouse) and then retrieved using Structured Query Language (SQL) by Performance Analysis Unit's analysts and the target calculated. As part of the Common Highways Agency Rijkswaterstaat Model (CHARM) project, command and control and RIF is likely to be enhanced. However, basic requirements of this project should ensure the data required to calculate this target remain available and therefore we do not anticipate seeing a step change in the data. Operations Directorate team are working closely to ensure requirements are built into enhanced system. b) STATS19 - Reliance upon the police to provide accurate data when they collect it at the accident scene. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70%.

METHODOLOGY

Field	Notes
Unit of measure	a) Incident numbers on the motorway network (Command and Control – 1 January to 31 December, Monday-Sunday [inc] between hours 0600 and 2200). b) Casualty numbers (broken down by fatal, serious, KSI and slight injuries) and contributory factors on the motorways (STATS19 - 1 January to 31 December).
Type of data	a) Command and Control Data - command and control data is retrieved from RIF using. Is placed into excel then manually analysed and the percentage of incidents within the specified filters/time is calculated. b) Numbers of casualties on motorways (broken down by fatal, serious, KSI and slight injuries) and contributory factor data supplied by STATS19 Road Accident dataset.
Geographical coverage	a) Motorways only, this includes A-roads classified as motorways, including the A282 Dartford Crossing / tunnel that completes the M25 loop. There are no current plans to extend the motorway network. b) 2015 referenced motorway network.
Baseline period	a) 2014 b) Average of 2005 – 2009 data
Baseline value	a) 42,827 b) 11,200 casualties

Field	Notes
Historical data	a) Command and Control Incident data available from 2006 b) STATS19 data available from 1994
Methodology and calculation	a) *Data collection:* • Command and Control captures details of all incidents that occur on the motorway network which the Highways England Traffic Officer Service is aware of or involved in. • Details of the incident are recorded manually by control room operator and are categorised by closure codes. For example a breakdown in the live lane will be categorised as a BD1 incident and a Fire incidents as an F10 incident. *Calculating the metric:* • Command and Control data is retrieved from RIF using SQL. It is then filtered manually based on the parameters described in this note, to give a total incident number figure. • To provide the number of incidents by incident type, the final closure code (the code which describes the overall nature of the incident) is counted. Incidents recorded on command and control can include breakdowns, obstructions, fires, road traffic collisions but can also include monitoring, observation and weather. b) *Data collection:* • Road accidents on the public highway in Great Britain, reported to the police and which involve human injury or death, are recorded by police officers onto a STATS19 report form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions) together with the vehicles and casualties involved and contributory factors to the accident (as interpreted by the police). The form is completed at either the scene of the accident, or when the accident is reported to the police *Calculating the metric:* • The number of casualties is calculated on an annual basis from the motorway data extracted from the DfT validated data. The number of casualties is the sum of the number of fatal, seriously and slightly injured casualties. • Contributory factor data is extracted from the same dataset.

Field	Notes
Data collection frequency	a) Command and Control data provided by Operations on an annual basis. b) STATS19 data provided by DfT and reported on an annual basis on the last Thursday of June each year.
Validation/ cleansing	a) *Data collection:* • Internal audits are conducted to ensure accurate recording of incident details on Command and Control. Performance Analysis Unit conduct quality and consistency checks on the command and control data on a monthly basis. This is not a formal process. The central office notifies regional centres of incidents that are reported as lasting over 5 hours – regional checks take place and corrections are made as necessary. Also internal management of the accuracy of data being recorded by operators at source is conducted daily by Traffic Officer control room management. *Calculating the metric:* • The final indicator (number of incidents) is sense checked against past performance b) *Data collection:* • The data recorded by the police on STATS19 is collated by the relevant local authority who undertakes an initial validation for their area. The data is then forwarded to DfT who undertake a further validation process for all UK data. *Calculating the metric:* • Once the national data is released (annually), Highways England extracts the data for the SRN and plots it against the referenced network, enabling any discrepancies to be identified. • The number of casualties are calculated on an annual basis from the motorway data extracted from the DfT validated data. This information is sense checked and compared to that of the previous years.
Data quality score	a) 3B Please note that the Command and Control system is an incident management system and is not designed for data and statistical purposes. **Validity = 3** Representativeness = 3: the indicator only refers to all incidents that occur on the motorway network which the Highways England Traffic Officer Service is aware of or involved in.

Field	Notes
	Accuracy = 2: As the indicator is purely about numbers, we believe this is accurate. Although, due to the nature of this data being manually entered there is a margin for human error, however this is a system that has been used for over ten years by experienced operators. **Reliability** A score of B is given as management are satisfied with the process of turning the raw data into the final indicator. Command and Control data is retrieved from RIF using SQL. It is then filtered manually based on the parameters described in this note, to give a total incident number figure. **b)** 2C **Validity = 2** 1 = The number of Killed and Seriously Injured are correct and all are reported. There are no errors in this value. 2 = The data represents the entire SRN and there are no holes. However, as noted in the risks to reporting, police coverage and capability are a potential issue. **Reliability** The process is not automated and is therefore a C.

REPORTING

Field	Notes
Highways England reporting	Command and Control reported annually at the end of June. In year casualty numbers (fatal, serious, KSI and slight) for Motorways as a whole, are reported at the end of June the following year (ie 2013 data is reported in June 2014) Contributory factor information and further breakdowns (eg by road name) are available in the October (ie 2013 data is reported in October 2014).
Outside scope of assessment	a) Incidents that occur off the motorway. b) STATS19 - There may be a requirement to capture and record casualties that fall outside the referenced network, which is outside of the scope of this indicator. This information is captured on an annual basis.

APPROVAL PROCESS

Field	Notes
Accountable Director	a) Safety, Engineering and StandardsDirector b) Safety, Engineering and StandardsDirector
Delivery Manager	a) Performance Analysis Unit Team Leader b) Safety Action Plan Coordinator

KEY INTERDEPENDENCIES

a)

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
KSIs KPI	An increase in traffic levels may result in an increase in incident numbers.	Exact linkage is currently undefined.	No management is in place at this stage.
Network availability PI	If the network availability falls this could result in an increased number of incidents.	Exact linkage is currently undefined.	No management is in place at this stage.
Traffic PI	Increased traffic volumes could lead to increased incident numbers.	Exact linkage is currently undefined.	No management is in place at this stage.
Savings KPI	Cost savings could affect future incident management development and capability.	Exact linkage is currently undefined.	No management is in place at this stage beyond identified need for Impact Assessment and discussions should cuts be made.

b)

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels may result in an increase in casualties, putting the target at risk.	Exact linkage is currently undefined.	No management is in place at this stage.
New and Upgraded Crossings KPI	New and upgraded crossings may result in a reduction in casualties on APTR.	Exact linkage is currently undefined.	No management is in place at this stage.
Flooding PI	Decrease in the number of flooding hotspots may result in a decrease in casualties on the APTR.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Casualty numbers and contributory factors for All-Purpose Trunk Roads (APTRs)

Narrative: Casualty numbers and contributory factors on the All-purpose Trunk Road (APTR) should be reported. This will help Highways England gain a better understanding of where collisions occur and determine how best to prevent them, which will contribute to the target of a 40% reduction in Killed and Seriously Injured (KSIs) by 2020.

Definition: Casualties in road traffic collisions on the Strategic Road Network (SRN) are reported by the police where injury has been sustained. The number of casualties is reported retrospectively on an annual basis via the validated STATS19 data which is released by the Department for Transport (DfT) on the last Thursday of June each year. The annual report entitled 'Reported Road Casualties on the SRN' provides a detailed breakdown of the data for the SRN, split by motorway and APTR, which includes casualty numbers and contributory factors.

In addition, annual 'Operational State of the Network Reports' are produced, which break down the validated STATS19 data to a regional level.

KEY DEFINITIONS

APTR - All-purpose trunk road, which comprises of dual and single carriageway A-roads on the SRN.

CASUALTY - A casualty is defined as a person killed or injured in an accident. Casualties are sub-divided into killed, seriously injured and slightly injured.

CONTRIBUTORY FACTOR - STATS19 contains 78 factors which, in the view of the officer at the scene, may have contributed to a collision. The officer at the scene can attribute up to six factors to each collision. The actual cause of an incident is only derived after a road death investigation.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	To report the number of casualties on the APTR network which will contribute to the KPI target of a 40% reduction in KSI casualties on the SRN by 2020.
Measure of success	Reduction in the numbers of casualties on the APTR and monitor contributory factors for emerging trends that can lead to interventions to support casualty reduction.
Assumptions	• The completion of the investment programme as proposed as part of the RIS / SBP. • That Highways England will receive some resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding guaranteed.

Field	Notes
	• An increase in partnership working. • Ongoing improvements in vehicle technology and medical advancements will positively impact on the reduction of the number of casualties on the APTR which in turn will contribute to achievement of the 40% reduction in KSIs.
Organisational dependencies	• Effective scheme delivery in line with the investment programme as part of the RIS. This includes the ring-fenced funding for safety. • Effective maintenance of the network infrastructure. • Effective incident management will result in fewer secondary incidents. This is likely to have a small benefit on KSI numbers. • Effective improvements to increase level of compliance ie roadworthy vehicles and drivers who obey the rules of the road. This is a significant dependency. • The cumulative effect of the above will positively impact upon the reduction in the number of casualties on the APTR which in turn will contribute to the achievement of the 40% reduction in KSIs.
Government targets	The Strategic Framework for Road Safety (2011) provides an outline of national targets and the RIS for the 2015/16 – 2019/20 Road Period Performance Specification sets out the requirement for a 40% KSI reduction target for SRN by 2020.
External influences	• Accuracy of data provided to DfT by the police. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70% as set out by the Association of Chief Police Officers (ACPO). • Government policy and resourcing of enforcement activity will have a significant impact on KSIs if the levels of police enforcement continue to drop. • Changes in levels of traffic on the network and developments within the automotive industry could influence KSI numbers. • Highways England's ability to work more closely with our partners to influence compliance and delivery of the Health and Safety 5 year plan. This document was published in September 2015 and includes both road users and road workers. The health, safety and wellbeing team are responsible for the road worker element of the plan and will liaise with the Health and Safety Executive (HSE), whilst the Safer Roads Group are responsible for road user safety. • The cumulative effect of the above will influence the number of casualties on the APTR and therefore the ability to meet the target.

RISKS

Field	Notes
To meeting target	• Conflicting priorities for investment resulting in a lack of funding for schemes and initiatives which would contribute towards meeting the target. • Marketing and advertising restrictions – preventing intelligence-led initiatives and campaigns from being undertaken. • Reliance on other partners/stakeholders to fund/undertake initiatives and campaigns. • Improving performance will also require resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding. • The value management process does currently not incentivise prevention schemes – this may result in key schemes not getting funded. • Heavy Goods Vehicles (HGV) speed limits are increasing as at April 2015 – it is unclear the impact this may have, but it may increase the number of casualties in the APTR.
To reporting	STATS19 - Reliance upon the police to provide accurate data when they collect it at the accident scene. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70%.

METHODOLOGY

Field	Notes
Unit of measure	Casualties numbers and contributory factors on the APTR (1 January to 31 December).
Type of data	Numbers of casualties (broken down by fatal, serious, KSI and slight injuries) and contributory factor data supplied by STATS19 Road Accident dataset.
Geographical coverage	2015 referenced SRN
Baseline period	Average of 2005 – 2009 data
Baseline value	10,503 casualties
Historical data	STATS19 data available from 1994
Methodology and calculation	*Data collection:* Road accidents on the public highway in Great Britain, reported to the police and which involve human injury or death, are recorded by police officers onto a STATS19 report form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions) together with the vehicles and casualties involved and contributory factors to the accident (as interpreted by the police). The form is

Field	Notes
	completed at either the scene of the accident, or when the accident is reported to the police.
	Calculating the metric: The number of casualties is calculated on an annual basis from the APTR data extracted from the DfT validated data. The number of casualties is the sum of the number of fatal, seriously and slightly injured casualties. Contributory factor data is extracted from the same dataset and comparisons are made against previous years.
Data collection frequency	STATS19 data provided by DfT and reported on an annual basis on the last Thursday of June each year.
Validation/ cleansing	*Data collection:* • The data recorded by the police on STATS19 is collated by the relevant local authorities who undertake an initial validation for their area. The data is then forwarded to DfT who undertake a further validation process for all UK data.
	Calculating the metric: • Once the national data is released (annually), Highways England extracts the data for the SRN and plots it against the referenced network, enabling any discrepancies to be identified. • The number of casualties is calculated on an annual basis from the SRN data extracted from the DfT validated data. This information is sense checked and compared to that of the previous years.
Data quality score	2C **Validity = 2** 1 = The number of KSIs are correct and all are reported. There are no errors in this value. 2 = The data represents the entire SRN and there are no holes. However, as noted in the risks to reporting, police coverage and capability are a potential issue. **Reliability** The process is not automated and is therefore a C.

REPORTING

Field	Notes
Highways England reporting	In year casualty numbers (fatal, serious, KSI and slight) for APTRs as a whole, are reported at the end of June the following year (eg 2013 data is reported in June 2014). Contributory factor information and further breakdowns (eg by road name) are available in the October (eg 2013 data is reported in October 2014).
Outside scope of assessment	There may be a requirement to capture and record casualties that fall outside the referenced network, which is outside of the scope of this indicator.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Safety Action Plan Coordinator

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels may result in an increase in casualties, putting the target at risk.	Exact linkage is currently undefined.	No management is in place at this stage.
New and Upgraded Crossings KPI	New and upgraded crossings may result in a reduction in casualties on APTR.	Exact linkage is currently undefined.	No management is in place at this stage.
Flooding PI	Decrease in the number of flooding hotspots may result in a decrease in casualties on the APTR.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: IRAP based road safety investigations, developed in conjunction with the Department, to feed into subsequent Route Strategies

Narrative: Highways England will work with the Department for Transport (DfT) and other highway authorities to identify the most appropriate road safety assessment rating system for assessing the comparative safety of our roads. This will build upon, but not be limited to, existing International Road Assessment Programme IRAP (International Road Assessment Programme) star rating systems such as EuroRAP. Highways England will develop and implement the chosen programme as appropriate. This work should feed into subsequent Route Strategies and influence the development of the next RIS.
Definition: A road safety assessment rating system will be developed for the Strategic Road Network (SRN); this will build on the current IRAP system considering incident location, collision data, traffic volume, and vehicle speed and road layouts. The revised rating system will be applied to the SRN and inform ongoing programmes of works.

KEY DEFINITIONS

IRAP - The International Road Assessment Programme (iRAP) is a charity registered in England which develops road assessment protocols including star rating for worldwide use in high, middle and low income countries.
EuroRAP - The European Road Assessment Association ("EuroRAP AISBL" or "EuroRAP") is an international not-for-profit membership Association registered in Belgium which enables the application of road assessment and benchmarking across the European continent including star rating. EuroRAP is an iRAP Member as a regional association which is self-governing.
EuroRAP STAR RATINGS - Star ratings are based on road inspection data and provide an objective measure of the level of safety which is 'built- in' to the road for all road users. Five star rated roads are the safest whilst one star rated roads are the least safe.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	90% of travel on the SRN will be roads with a safety rating of EuroRAP 3* (or equivalent to a new Highways England Star rating system) by the end of 2020.
Measure of success	System developed and applied to the network in 2018, to inform route strategies and investment programmes for the second Road Period.
Assumptions	Required system can be developed from existing established EuroRap platform and that existing baseline network data is available for interrogation/development of Highways England's Safety Model.
Organisational dependencies	The outcomes will inform the development of the Route Strategies and provide information to support the investment programmes within Operations directorate (OD), the Asset Information Group, Strategy &

Field	Notes
	Planning directorate (S&P) and Major Projects directorate (MP).
Government targets	Strategic Framework for Road Safety (2011) provides an outline of national targets.
External influences	Ministers, DfT and relevant local authorities support the development of the safe system approach.

RISKS

Field	Notes
To meeting target	The current video surveys of the network may not be of a good enough quality to enable coding, so may need to be revisited. There is a lack of data for some road user types ie Vulnerable Users.
To reporting	Possible delay to reporting if the video surveys are not of a sufficient quality to enable coding. Possible risks if there is unsuccessful partnership working with IRAP and DfT – this is to be addressed via Memorandums of Understanding.

METHODOLOGY

Field	Notes
Unit of measure	N/A (in future the unit of measure will be: Number of miles inspected and average star rating across all roads).
Type of data	• Drive-through inspections, video based drive through inspections, video coding, collision data, traffic flows, speed data, asset management data, and road layouts. Intelligence and watchman data will be input in to the model. • The above lists existing data collection undertaken by Highways England which could be used. Further bespoke data may be required which is to be confirmed as part of the scoping work for this indicator.
Geographical coverage	The entire SRN.
Baseline period	2014 Data Surveys will give us a baseline star rating (we expect to have the 2014 baseline by March 2016 approx.).
Baseline value	To be confirmed in approx. March 2016
Historical data	2010 SRN EuroRap Rating Report; Asset Information (Video Surveys/LiDAR); speed data, collision data, traffic flow data, STATS19 Accident Reports.

Field	Notes
Methodology and calculation	To be identified as part of system development.
Data collection frequency	Baseline data to be collected within 6 months then further collection frequency to be confirmed.
Validation/ cleansing	To be identified as part of system development.
Data quality score	3D **Validity** Accuracy has been scored a 3, as various data sources are used and have different levels of accuracy, and a specific data validation process does not exist. The data is not fully representative of the SRN, so at this stage the representativeness score is 3. **Reliability** The process of analysing the data is not consistent and is not automated. The score is therefore a D. Once the model is developed and new data is collected this alpha numeric score will change.

REPORTING

Field	Notes
Highways England reporting	To be confirmed.
Outside scope of assessment	The performance specification does not require us to demonstrate we have delivered the 90% of network at 3* by 2020, this is covered in other documents, but not in performance specification, which only requires us to report on the development of the safety rating system which informs wider planning.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Safety Action Plan Coordinator

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
KSI KPI	A reduction in KSI may result in an improvement in the IRAP score	Exact linkage is currently undefined.	No management is in place at this stage.
Incident numbers PI	A reduction in incident numbers and contributory factors for motorways may result in an improvement in the IRAP score.	Exact linkage is currently undefined.	No management is in place at this stage.
Casualty numbers PI	A reduction in casualty numbers and contributory factors on the APTRs may result in an improvement in the IRAP score.	Exact linkage is currently undefined.	No management is in place at this stage.
Accident frequency rate PI	A reduction in the accident frequency rate may result in an improvement in the IRAP score.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Accident Frequency Rate (AFR) for construction and maintenance workers, and for Operations (Traffic Officer Service and Regional Control Centre staff)

Narrative: The safety of those using or working on the network is paramount. No one should be harmed when travelling or working on the Strategic Road Network (SRN).

Definition: This metric will be split into two parts, and this note will be split into two parts throughout [If no reference is made to a) or b), assume that the information relates to both indicators]:

- **a)** AFR of construction and maintenance workers in Highways England's supply chain.
- **b)** AFR of Operations Directorate (The Traffic Officer Service and Regional Control Centre staff).

The Accident Frequency Rate (AFR) is the ratio of the number of Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) reportable personal injury accidents and fatalities in a population, to the hours worked by that population, and is expressed per 100,000 hours. It is a widely accepted comparator of the accident rate.

KEY DEFINITIONS

SUPPLY CHAIN - External organisations providing resources, activities, and information to Highways England in order to help meet its business requirements. Highways England is acting in a client capacity to the construction and maintenance industry, procuring services on a fixed term basis.

ROADWORKER - Road workers include all operatives working on Highways England's network who are directly exposed to risks from network users. These include all workers engaged in traffic management activities and incident support services, maintenance and renewal schemes, vehicle recovery operators and any other activities where live traffic is present.

CONSTRUCTION AND MAINTENANCE WORKER - All operatives undertaking construction and maintenance activities in designated/demarcated sites on the SRN.

TRAFFIC OFFICER SERVICE - The Traffic Officer Service patrols England's motorways, helping to keep traffic flowing smoothly. The Traffic Officers who perform this service help to manage incidents and provide many functions including: clearing incidents, helping broken down vehicles or vehicles involved in a collision, removing damaged and abandoned vehicles, and providing mobile and temporary closures.

REGIONAL CONTROL CENTRE STAFF- As well as the Traffic Officer Service, there are approximately 300 office based staff in Regional Control Centres

RIDDOR- RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013) is the legislation that requires employers, and other people in control of work premises, to report and keep records of work-related accidents which cause death;

work-related accidents which cause certain serious injuries (reportable injuries); diagnosed cases of certain industrial diseases; and certain 'dangerous occurrences' (incidents with the potential to cause harm). There are also special requirements for gas incidents.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	a) N/A b) N/A
Measure of success	a) Reducing the AFR b) Reducing the AFR We will also benchmark against other organisations.
Assumptions	a) Reducing the AFR is dependent on: • funding being available for the Health & Safety 5 Year Plan [funding is sourced from within Highways England from Portfolio 01 Making the Network Safer • the supply chain continuing to comply with procedures and legislation, and subsequent guidance issued by Highways England (Note: compliance is assessed via sample site inspections undertaken in Major Projects directorate (MP) and Operations (OD) based on construction legislation); and • supply chain compliance with procedures. b) Reducing the AFR is dependent on: • a focus on staff safety within Highways England (Improving safety related behaviours will be addressed by the Behavioural Management Programme which has been started by the Operations Directorate). Any policy decisions (such as increase in speed limits), not adversely affecting Traffic Officer safety; and • Compliance with procedures. Ensuring compliance is assisted through our assurance and compliance programme which, for three days each year, assesses the performance of each Traffic Officer (and line manager), checking compliance with procedures. Line managers also perform quarterly observation checks of the traffic officers they are responsible for, to help ensure compliance with procedures.
Organisational dependencies	a) Performance is dependent in part on OD and MP engaging with their contractors to drive performance. This is predominantly done through the Contract Performance Framework score, which drives performance and consists of a suite of indicators which are monitored. AFR is one of these indicators. Strong Contract Performance Framework scores can have a positive impact on future contract tendering.

Field	Notes
	b) Performance is dependent in part on the work Operations Directorate and Finance and Business Services Directorate (FBS) do as they promote staff based safety. Currently there are numerous programmes which are promoted. These include the Health, Safety and Wellbeing programme, and the Health & Safety 5 Year Plan which aims to insure no one is injured at work. The Health and Safety 5 year plan will directly influence the way in which safety is managed internally and in our supply chain. This strategy covers road user and road worker safety.
Government targets	N/A
External influences	Interactions with European Partners may influence traffic management approaches; developments in improved Traffic Officer Vehicles, compliance with legal duties (eg Health and Safety at work Act). The Health and Safety Executive (HSE) (as our regulator) can also influence how we manage and report the AFR. If UK legislation or government priorities were to change (eg the definition of a RIDDOR), this may also impact how we manage and report AFR.

RISKS

Field	Notes
To meeting target	Risks to reducing the AFR include (for both measures): • Highways England guidance/procedures to staff and contractors not being fit for purpose in the dynamic and flexible environment eg Chapter 8 of the Departments for Transport's (DfT) Traffic Signs Manual not being fit for purpose. Chapter 8 is continually reviewed to mitigate against this risk; • There may be fewer opportunities to conduct road worker trials as the focus on delivery increases in line with increased investment. This may impact the extent to which we improve working practices; • There is a risk that the Health and Safety Management system is not fit for purpose, resulting in the absence of adequate controls to prevent accidents. The HSMS was published on March 31st 2017, the publication was supported with 125No training sessions covering approximately 1200No Managers and employees across the business. An audit schedule is being applied in order to establish the degrees of compliance against the HSMS by the business. The audit schedule has prioritised the TOs and MP areas of the business, and commenced in January 2018. • Failure to provide adequate health and safety training due to changes in Highway England's Learning

Field	Notes
	& Development (L&D) provider. Highways England are currently sourcing a replacement to this provider. We now have a new provider and we are working with them to ensure the H&S training meets the needs of the business • Potential shortages in the construction labour market give the possibility of our supply chain employing less experienced/competent staff, potentially increasing the likelihood of accidents in the supply chain.
To reporting	For both measures there is a risk that: • Information collection mechanisms are not fit for purpose to meet business needs. • The definition of a RIDDOR gets updated, which may cause a step change in performance. • Also, there is a risk that employees do not report accidents (low risk) or enter their working hours (medium risk) onto the relevant system – this is mitigated in different ways for a) and b), as set out below: a) For the supply chain, it is a legal requirement that they record all RIDDORs, and the correct recording of RIDDORs and hours worked is part of their contract with Highways England - compliance with the contract improves the chance of successful tendering in future. Similarly, it is in the supply chain's interest to log their hours correctly for payment purposes. This risk is also mitigated by the National Health and Safety Division (Highways England) and consultants undertaking inspections and reviewing site accident books (four of these are undertaken each month for MP sites, and four a month for OD sites). b) For the Operations Directorate, it is a legal requirement to record all RIDDORs. Traffic Officers in particular often work in pairs, which helps ensure accidents are recorded. • There is also a risk that line managers do not competently update IRIS (Incident Reporting and Investigation System), this is mitigated by ongoing training and the implementation of performance management systems. • The Health and Safety 5 year plan contains action 93 which is the implementation of a single reporting system replacing the current internal and external reporting systems, this action was launched in October 2017.

METHODOLOGY

Field	Notes
Unit of measure	Rate
Type of data	Accident & incident data, hours worked data. a) Incident data is sourced from Highways England's Accident and Incident Reporting System (AIRSweb) and includes incidents occurring whilst working on the whole of a contract/project, including those of any office based staff. The number of hours worked is captured from AIRSweb and includes the number of hours worked on the whole of a contract/project including any office based staff. (see IAN 128/15/AR) b) A single system is used for the collection of data for Highways England employees and all contractors and supply chain employees Incident data is sourced from Highways England's Accident and Incident Reporting System (AIRSweb) and includes incidents occurring whilst working on the whole of a contract/project, including those of any office based staff. These incidents may be RIDDORs, but also less significant incidents such as near misses and undesirable circumstances. The supply chain number of hours worked is captured from AIRSweb and includes the number of hours worked on the whole of a contract/project including any office based staff. (see IAN 128/15/AR and CHE 415/18) The number of hours worked by Highways England employees is captured from HR data (37hours x FTE), which is adjusted for leave and absence.
Geographical coverage	a) SRN b) Operations Directorate
Baseline period	Rolling year as at March 2015
Baseline value	a) Rolling year as at March 2015 is 0.15 b) Rolling year as at March 2015 is 0.43
Historical data	a) Data has been recorded from 2009 b) Data has been recorded from 2011 Note: In 2012 the definition of RIDDOR slightly changed. The definition point for reporting lost time incidents increased from over three days to over seven days.

Field	Notes
Methodology and calculation	*Data collection:* a) This metric uses the number of incidents and hours worked for construction and maintenance workers. These include all operatives working on Highways England's network who are directly exposed to risks from network users. These include all workers engaged in traffic management activities and incident support services, maintenance and renewal schemes, and other activities where live traffic is present. This data is recorded onto AIRSweb. b) This metric uses the number of incidents and hours worked for all of the Traffic Officer Service and all Regional Control Centre staff. The incident data is taken from AIRSweb, and the hours worked data is captured from HR data (37hours x FTE), which is adjusted for leave and absence.
	Calculating the metric: AFR is calculated on the basis of incidents reportable under the RIDDOR, and presented as a 12 month rolling average, per 100,000 hours worked. It is a legal requirement to record and report all RIDDOR incidents. The AFR is calculated as follows: AFR = (No. of reportable incidents per year/(No. of hours worked in the year) x 100,000)
Data collection frequency	Data is collected continuously and reported monthly on a rolling 12 month basis
Validation/ cleansing	*Data collection:* a) Data input is reliant on individuals entering accident information. Highways England employees do check all RIDDOR and high potential near misses on AIRSweb records by reading the descriptive text in each record and ensuring the correct category has been chosen, eg RIDDOR or near miss. Also, the National Health and Safety Division and consultants undertake inspections and review site accident books for errors. b) Data input is reliant on individuals entering accident information. However, the descriptions entered for all incidents that have the potential to be a RIDDOR, are checked by the National Health and Safety Division, to ensure they are in fact a valid RIDDOR.
	Calculating the metric: For both indicators, appropriate checks against previous performance are carried out to help assure that the final indicator is calculated properly from the raw data. See the data quality score section for more information. Internal audit also interrogate the system annually to validate both AFR scores that are reported.

Field	Notes
Data quality score	a) Data Quality Score: 3B The representativeness of the data is classed as 3. HSE estimate that only 33-50% of accidents at work that fall under RIDDOR definitions are actually reported. However, it is a legal requirement that the supply chain record all RIDDORs, and the correct recording of RIDDORs and hours worked is part of their contract with Highways England - compliance with the contract improves the chance of successful tendering in future. Additionally, it is in the supply chain's interest to log their hours correctly for payment purposes. The National Health and Safety Division and consultants also undertake inspections and review site accident books. The accuracy of the data is classed as 2, for similar reasons as above in terms of contractual compliance, payment and inspections. Additionally, Highways England employees do check all RIDDOR and high potential near misses on AIRSweb records by reading the descriptive text in each record and ensuring the correct category has been chosen eg RIDDOR, near miss. This is done by at least two people. As such, the validity score is 3. The reliability of the data is classed as B, because appropriate checks against previous performance are carried out to help assure that the final PI is calculated properly from the raw data. The process is partly automated, checked by at least two people, and management are satisfied with the process. b) Data Quality Score: 2B The representativeness of the data is classed as 2. We believe all possible accident data is used - it is a legal requirement to record all RIDDORs. HSE's estimates for the supply chain do not apply here as this measures Highways England's internal staff. Traffic Officers in particular often work in pairs, which helps to ensure accidents are recorded. The accuracy of the data is classed as 2, for similar reasons as above. Additionally, the descriptions entered for all incidents that have the potential to be a RIDDOR, are checked by the National Health and Safety Division, to ensure they are in fact a valid RIDDOR. This is done by at least two people. As such, the validity score is 2. The reliability of the data is classed as B, because appropriate checks against previous performance are carried out to help assure that the final PI is calculated properly from the raw data. The process is partly automated, and management are satisfied with the process.

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of assessment	a) Pre construction (Design and survey) phase data – the AFR only considers time spent in construction and maintenance. b) The metric does not include Highways England office staff apart from those in the Regional Control Centres

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety Engineering and Standards Director
Delivery Manager	Health and Safety Divisional Director

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	For both indicators, an increase in traffic levels may result in more incursions, impacting the AFR.	Exact linkage is currently undefined.	No management is in place at this stage.
Investment Plan	The increase in spend could increase the AFR for the supply chain. There is a greater exposure to risk on site and also the possibility of our supply chain employing less experienced staff.	Exact linkage is currently undefined – small magnitude likely	No management is in place at this stage.
Average Speed PI	For both indicators, an increase in speed may increase severity of any injuries, thus increasing the likelihood of a RIDDOR.	Exact linkage is currently undefined.	No management is in place at this stage.

Improving User Satisfaction

KPI: The percentage of NRUSS respondents who are Very or Fairly Satisfied

Narrative: The measure of user satisfaction currently is the National Road Users' Satisfaction Survey (NRUSS). We have a target of improving the overall NRUSS score to 90% by 31 March 2017 and then maintain or improve over the remaining years of the first Road Period. Highways England should report on progress. NRUSS is undertaken by Transport Focus on a monthly basis and the data provided to Highways England.

Definition: Highways England aims to deliver cost effective customer satisfaction that delivers maximum benefits. The National Road Users' Satisfaction Survey (NRUSS) is one measure used to indicate whether the network operator achieves this. The survey provides data to provide information on customer satisfaction in using the Strategic Road Network (SRN)..It provides an overall satisfaction score and data on 5 performance indicators; journey time, roadworks management, upkeep of the network, information and signage and safety. It provides national and regional data, enabling Highways England to highlight regional differences in perceptions.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	Achieve a score of 90% by 31 March 2017, using a cumulative score over a 12 month period, , and then maintain or improve.
Measure of success	Road users and Highways England should see an increase in customer satisfaction over time.
Assumptions	The responsibility for the National Road Users' Satisfaction Survey moved to Transport Focus (TF) in April 2016. The methodology that was used whilst NRUSS was administered by Highways England remains the same to allow continuity of reporting. Provision has been made in the Roads Investment Strategy (RIS) (or subsequent governance documents) to facilitate transition from NRUSS to a new satisfaction measure. It is likely that both surveys will run in parallel and efforts will be made to calibrate the scores. This will allow us to understand what the equivalent KPI value will be when using results from the new TF survey. The general assumptions are listed below, but please note that they cannot be measured as we do not ask questions that provide an answer or indication of the influence of these: • Assuming speed limit doesn't drop • Assuming valid reporting and interview process • Assuming we spend the money

Field	Notes
	• Assuming not an influx of traffic • Assuming National Traffic Information Centre (NTIC) contract continues • Assuming safety schemes/funds get spent The network will experience a high level of road works during the first Road Period. Depending on how these are managed and how we communicate to customers, this could impact on satisfaction, which could decrease or increase as a result. The increase in maintenance activities planned for the network could mean we see an increase in satisfaction for Network Condition, as both are something that we measure NRUSS is measured based on respondents' perception and this can be impacted by external events outside of our control. The sample size is approximately 2000 respondents over a 12 month period and some performance indicators such as roadworks have too small a sample size to be statistically significant.
Organisational dependencies	The responsibility for improving customer satisfaction does not belong in just one area of the business. It is spread across the whole of Highways England and therefore the dependency on all areas of Highways England and our Supply Chain to listen and act on customer feedback is crucial for success. Developing a culture where customer is implicit rather than explicit is key to delivering strong customer service.
Government targets	Not applicable
External influences	From April 2016 Transport Focus took over responsibility of the National Road Users' Satisfaction Survey. NRUSS will definitely continue to April 2019. From April 2016 and onwards it is up to Transport Focus to decide how long it will continue in its current form and when to switch over to the new Strategic Road User Survey (SRUS) .

RISKS

Field	Notes
To meeting target	Investment in the network could affect satisfaction scores negatively, especially with the amount of maintenance expected on the network during the first Road Period. Therefore, satisfaction with roadworks (one of the performance measures used to calculate overall satisfaction) could impact on whether the target is met – maintaining current levels of satisfaction during this first two years is accepted as a 'stretch' target. Customers' expectations are rising and they have become less tolerant of such things such as long stretches of roadworks on the SRN without any sign of activity and more demanding, therefore there will be a big

Field	Notes
	increase in customers' expectation over time.
To reporting	The current contract is administered by TF; they provide us with monthly reporting of the performance score. Highways England have limited control over changes to data and reporting. Any changes result in cost between TF and the supplier.

METHODOLOGY

Field	Notes
Unit of measure	Overall satisfaction score (%),using a cumulative score over a 12 month period calculated through the National Road Users' Satisfaction survey.
Type of data	National Road Users' Satisfaction Survey score (%) – currently collected and collated by AECOM for Transport Focus).
Geographical coverage	England
Baseline period	2012/13, 2013/14
Baseline value	2012/13 = 90.73% 2013/14 = 89.63%
Historical data	The survey started in its current format in April 2011, therefore historical trend data is available back to this date. However customer satisfaction data, in various forms, has been collected since 1995.
Methodology and calculation	*Data Collection:* A quota sample survey is used. The sample size is around 2016 per annum, equally split between Highways England's seven regions and equally spaced through the year, with approx. 24 interviews per region per month. A sample of this size allows comparison with previous data, and is sufficient to provide confidence in the findings, even at a regional level. Quotas are set to reflect the general population aged 17 and over in terms of age, gender and working status. Inclusion of working status ensures that not just people who are more likely to be at home are surveyed. Respondents also need to have used Highways England's network as a driver or a passenger in the last 12 months. To be eligible to take part in the survey, respondents must be aged 17 or over and have used the SRN at some time in the 12 months preceding. Interviews are conducted in home using Computer Assisted Personal Interviewing (CAPI). Six sample points with four interviews in each per month per region are carried out. Each interview lasts up

Field	Notes
	to 45 minutes. This provides a diverse spread geographically. Sample points in each region are randomly sampled by output areas (OA). The Postal Address File is used to identify addresses within each selected output area, and typically this includes around 100 addresses which are available for survey. Respondents are asked how satisfied/dissatisfied they were in relation to their last journey for five indicators of performance. The questions relate to journey time; the management of roadworks; road signs (including static direction signs and variable message signs); general upkeep (routine maintenance) and how safe/unsafe they felt. They are asked separately for their experience on trunk roads and motorways. Respondents are also asked why they are satisfied/dissatisfied. The performance measure is computed from satisfaction ratings for five key aspects of the most recent journey undertaken on Highways England's network, these five aspects are Journey Time, Roadworks Management, Upkeep of the Network, Information and Signage and Safety.
	Calculating the metric: The performance measure is computed from cumulative satisfaction ratings over the past 12 months for five key aspects of the most recent journey undertaken on the SRN, these five aspects are journey time, roadworks management, upkeep of the network, information and signage and safety. Road users rate their satisfaction levels on a 1-5 scale for journey time, roadworks management, upkeep of the network and information and signage for their last journey made on a motorway or trunk road (1:very satisfied, 2:fairly satisfied, 3:Neither satisfied nor dissatisfied, 4:fairly satisfied and 5:very dissatisfied). Safety is also rated on a 1 to 5 scale, with scores for 'fairly safe' and 'very safe' equating to fairly satisfied and very satisfied respectively. Equal weighting is given to each response.
Data collection frequency	Data is collected on a continuous basis and reported on a monthly basis.

Field	Notes
Validation/ cleansing	The market research programme is used to administer the questionnaire. This produces data directly into SPSS format for analysis, and readily provides a written equivalent of the questionnaire, for ease of checking. The survey sample is selected via quota sampling, with the sample structured so that broadly equal numbers of interviews are completed in each of the network operators regions. This results in an unbiased survey sample which is broadly representative of the adult population of England. In order to check on the quality of the work undertaken by the interviewers, 10% of addresses were selected each month for re-contact to verify that the interviewers had contacted the addresses, followed the correct procedures and coded the outcome correctly. A technical note exists providing full details on data validation cleansing called "2014 - 06 Information Note 42 - NRUSS 2013-14 Technical Report v2.0.pdf". This can be provided by the delivery manager.
Data quality score	1B **Validity** The questionnaires are carried out manually, so what is being entered has no errors. Therefore, the accuracy is 1. The data is statistically fully representative of England and is scored 1. **Reliability** AECOM have set up automatic processes to analyse and process the data. The data is also manually checked at the end, and is therefore scored as B.

REPORTING

Field	Notes
Highways England reporting	Monthly, using a cumulative score over a 12 month period
Outside scope of assessment	Results from other surveys that may be carried out by Highways England or other organisations should not be used when calculating overall score.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Head of Customer Experience

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
All KPI's/PI's except those for Biodiversity (and associated PI's)	Those specified have the potential to have an impact on performance of the KPI.	Exact linkage is currently undefined.	Customers should be considered in all that we do, therefore impact of this KPI and PIs will reflect this.

PI: The Percentage of NRUSS respondents who are Very or Fairly Satisfied with: Journey Time; Information and Signs; Management of roadworks; Feeling Safe; Upkeep

Narrative: Highways England will provide PIs to give more detailed information about user satisfaction, and support detailed evaluation.

Definition: The network operator aims to deliver cost effective customer satisfaction that delivers maximum benefits. The National Road Users' Satisfaction Survey (NRUSS) is used to indicate whether Highways England achieves this. The NRUSS is carried out on a continuous basis throughout the year.

The survey data is used to calculate performance scores, for motorways and trunk roads making up the Strategic Road Network (SRN) and helps Highways England identify what is important to road users and priorities for improvement to deliver a modern network.

Respondents are asked how satisfied/dissatisfied they were in relation to their last journey for five indicators of performance. The questions relate to journey time; the management of roadworks; road signs (including static direction signs and variable message signs); general upkeep (routine maintenance) and how safe/unsafe they felt. They are asked separately for their experience on trunk roads and motorways. Respondents are also asked why they are satisfied/dissatisfied.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Road users and Highways England should see an increase in customer satisfaction over time.
Assumptions	The responsibility for the National Road Users' Satisfaction Survey moved to Transport Focus (TF) in April 2016. The methodology that was used whilst NRUSS was administered by Highways England remains the same to allow continuity of reporting. The general assumptions are listed below, but please note that they cannot be measured as we do not ask questions that provide an answer or indication of the influence of these: • Assuming speed limit doesn't drop • Assuming valid reporting and interview process • Assuming we spend the money

Field	Notes
	• Assuming not an influx of traffic • Assuming roadworks continue to be managed well • Assuming National Traffic Information Centre (NTIC) contract continues • Assuming safety schemes/funds get spent • It is assumed that customer expectations do not rise The network will experience a high level of road works during the first Road Period. Depending on how these are managed and how we communicate to customers could impact on satisfaction, which could decrease or increase as a result. The increase in maintenance activities planned for the network should mean we see an increase in satisfaction for Network Condition, as both are something that we measure
Organisational dependencies	The responsibility for improving customer satisfaction does not belong in just one area of the business. It is spread across the whole of Highways England and therefore the dependency on all areas of Highways England to listen and act on customer feedback is crucial for success.
Government targets	Not applicable
External influences	From April 2016 Transport Focus took over responsibility of the National Road Users' Satisfaction Survey. NRUSS will definitely continue to April 2019. From April 2016 and onwards it is up to Transport Focus to decide how long it will continue in its current form and when to switch over to the new Strategic Road User Survey (SRUS) ..

RISKS

Field	Notes
To meeting target	Investment in the network could affect satisfaction scores, especially with the amount of maintenance expected on the network during the first Road Period. Therefore, satisfaction with roadworks (one of the performance measures used to calculate overall satisfaction) could impact on whether the target is met, which is already stretching.
To reporting	The current contract is administered by TF, they provide us with monthly reporting of the performance score. Highways England have limited control over changes to data and reporting. Any changes result in cost between TF and the supplier

METHODOLOGY

Field	Notes
Unit of measure	Satisfaction score (%),using a cumulative score over a 12 month period.
Type of data	National Road Users' Satisfaction Survey scores (%). Five performance measures for satisfaction on - journey time, roadworks, general upkeep, signage and information, and safety, each scored separately by motorway and trunk road, by region plus an overall satisfaction score - currently collected and collated by AECOM for Transport Focus.
Geographical coverage	England
Baseline period	2013 – 2014
Baseline value	Journey time = 88.51%, roadworks management = 71.73%, general upkeep = 89.76%, signage and information = 90.50%, safety = 92.50%
Historical data	Satisfaction data under these five measures exists from April 2011.
Methodology and calculation	*Data collection:* A quota sample survey is used. The sample size is around 2016 per annum, equally split between Highways England's seven regions and equally spaced through the year, with approx. 24 interviews per region per month. A sample of this size allows comparison with previous data, and is sufficient to provide confidence in the findings, even at a regional level. Quotas are set to reflect the general population aged 17 and over in terms of age, gender and working status. Inclusion of working status ensures that not just people who are more likely to be at home are surveyed. Respondents also need to have used the SRN as a driver or a passenger in the last 12 months. To be eligible to take part in the survey, respondents must be aged 17 or over and have used the operators' network at some time in the 12 months preceding. Interviews are conducted in home using Computer Assisted Personal Interviewing (CAPI). Six sample points with four interviews in each per month per region are carried out. Each interview lasts up to 45 minutes. This provides a diverse spread geographically. Sample points in each region are randomly sampled by output areas (OA). The Postal Address File is used

Field	Notes
	to identify addresses within each selected output area, and typically this includes around 100 addresses which are available for survey. Respondents are asked how satisfied/dissatisfied they were in relation to their last journey for five indicators of performance. The questions relate to journey time; the management of roadworks; road signs (including static direction signs and variable message signs); general upkeep (routine maintenance) and how safe/unsafe they felt. They are asked separately for their experience on trunk roads and motorways. The performance measure is computed from satisfaction ratings for five key aspects of the most recent journey undertaken on the Agency network, these five aspects are Journey Time, Roadworks Management, Upkeep of the Network, Information and Signage and Safety.
	Calculating the metric: Road users rate their satisfaction levels on a 1-5 scale for journey time, roadworks management, upkeep of the network and information and signage for their last journey made on a motorway or trunk road (1:very satisfied, 2:fairly satisfied, 3:Neither satisfied nor dissatisfied, 4:fairly satisfied and 5:very dissatisfied). Safety is also rated on a 1 to 5 scale, with scores for 'fairly safe' and 'very safe' equating to fairly satisfied and very satisfied respectively. Equal weighting is given to each response.
Data collection frequency	Data is collected on a continuous basis and reporting on a monthly basis.
Validation/ cleansing	• The market research programme is used to administer the questionnaire. This produces data directly into SPSS format for analysis, and readily provides a written equivalent of the questionnaire, for ease of checking. • The survey sample is selected via quota sampling, with the sample structured so that broadly equal numbers of interviews are completed in each of the network operators regions. This results in an unbiased survey sample which is broadly representative of the adult population of England. • In order to check on the quality of the work undertaken by the interviewers, ten per cent of addresses were selected each month for re-contact to verify that the interviewers had contacted the addresses,

Field	Notes
	followed the correct procedures and coded the outcome correctly. • A technical note exists providing full details on data validation cleansing called “2014 - 06 Information Note 42 - NRUSS 2013-14 Technical Report v2.0.pdf”. • This can be provided by the delivery manager.
Data quality score	1B **Validity** The questionnaires are carried out manually, so what is being entered has no errors. Therefore, the accuracy is 1. The data is statistically fully representative of England and is scored 1. **Reliability** AECOM have set up automatic processes to analyse and process the data. The data is also manually checked at the end, and is therefore scored as B.

REPORTING

Field	Notes
Highways England reporting	Monthly, using a cumulative score over a 12 month period
Outside scope of assessment	Results from other surveys that may be carried out by Highways England or other organisations should not be used when calculating overall score.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Head of Customer Experience

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
All KPIs/PIs except those for Biodiversity (and associated PI's)	Those specified have the potential to have an impact on the performance of the KPI.	Exact linkage is currently undefined.	Customers should be considered in all that we do, therefore impact of this KPI and PIs will reflect this.

Supporting the Smooth Flow of Traffic

KPI: The percentage of the SRN available to traffic

Narrative: During the first Road Period Highways England will undertake a significant programme of maintenance, renewals, and enhancements which will affect network availability. That said, Highways England will deliver the programme of work set out in the Investment Plan while minimising negative impacts and keeping traffic moving. A threshold for availability has been set to help balance these priorities.

Highways England will report on the percentage of the Strategic Road Network (SRN) that is available and act in such a way that lane availability does not fall below 97% in any given rolling year. A lane is considered unavailable if it is closed to traffic because of planned roadworks. This measures the extent of roadworks and so incentivises Highways England to plan these works in a way that minimises driver disruption, whilst reflecting the impact of the Investment Plan. More broadly we require Highways England to plan and deliver roadworks in a way that minimises inconvenience to road users.

Definition: The percentage of the SRN available to traffic

This measure presents the (running) lane availability of the SRN with respect to closures caused by roadworks. The availability of the motorway and A road network is measured by the percentage of lane-kilometre-days available. A lane is considered unavailable if it is closed to traffic because of roadworks recorded by Highways England. A lane is still considered available if it has been narrowed or had speed limits imposed during traffic management for roadworks purposes. Lane closures caused by incidents are excluded, as are any other closures for non-roadworks reasons. A lane is considered added if it is brought into use during works to compensate for the closure of another lane. Hard shoulders used dynamically are not treated as running lanes for this availability calculation.

KEY DEFINITIONS

NOMS - Network Occupancy Management System

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	Maximise lane availability so that it does not fall below 97% in any one rolling year. For the avoidance of doubt this means that short term spikes in lane use for works are permitted both from month to month, and from one part of the network to another. The target applies to an all-network rolling year average, calculated each month using data from the preceding rolling year.
Measure of success	Achieving the target.
Assumptions	Assumptions had to be made when providing the forecast for the target note. These are listed below.

Field	Notes
	Because something is listed in the assumptions the reader should not assume there is no real-world effect, it may be that information was not readily available at the time of making a projection: • The availability figure calculation assumes that there will be no change in the impact from third parties undertaking works on the SRN eg gas / electric / water utilities. It should be noted that any effects of lane closures for High Speed 2 have not been included in projections; • The planned change to a new asset management system will not affect the value of the measure noticeably. It is presumed that if an effect is noted here which relates just to this systems migration rather than to a real-world change on the network that a matching adjustment in the level of the target may be considered; • The only uncertainty in the forecast is the statistical uncertainty from the regression between spend and occupancy taken over the period April 2012 to May 2014; • The programme mix and delivery methods during the first Road Period will remain as in April 2012 to May 2014; • Relationship between money spent and occupancy during the first Road Period will remain as in April 2012 to May 2014; • Efficiency of use of roadspace will remain stable; • Works are recorded accurately; • Historical data is correct; • Spending projection as of June 2014; • There will be no significant delays in delivery, including impacts of severe weather; • Different ways of putting down pavement surfacing renewals will not affect occupancy; • Increased pressures on delivery, eg requirement to deliver 20% more for the same spend, will be offset by, for example, more efficient use of roadspace; • There will be no noticeable impact on availability from increased requirement for technology maintenance as more roads are being upgraded to Smart Motorway. The impact of this risk is unknown at this moment; • There will be no noticeable impact on availability resulting from the absence of a hard shoulder on all lane running Smart Motorways; • Availability impacts from the construction of HS2 crossings were not included; • Changes in the respective responsibilities of Highways England and its supply chain will have no

Field	Notes
	impact on the measure (All works are currently delivered by the supply chain, though changes are being explored in that respect [Area 7 pilot])
Organisational dependencies	This target competes directly with the requirement to deliver increased capital investment and maintenance on the SRN. Achieving this target will depend on working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely and so as to minimise additional delay.
Government targets	There is no associated government target.
External influences	The measure may be affected by changes in the working practices in the supply chain. Checks and challenges on supply chain activity can take place if commissioned. Legislative or other restrictions on Highways England limiting flexibility in the delivery of works and traffic management could influence the measure. Requirements to deliver more works than anticipated would reduce the measure.

RISKS

Field	Notes
To meeting target	This is a target that may by threatened by a number of factors. Some of these factors represent competing priorities and not all of them are in Highways England's control. The metric could be reduced further than forecast because of: Delivery • Higher spending (and as such more occupancy) than projected (Spending projection as of June 2014); • Increased pressures on delivery, with the requirement to deliver more for the same spend. (The base period used for the projection was April 2012 to May 2014.); • Changes in the mix of schemes in the Road Period compared to past history, resulting in delivering schemes with high occupancy requirements; • A change in the projected spend profile, for example because of delays in a major project which could be caused by a bad winter, a legal challenge, or expiry and re-letting of delivery frameworks or other factors; • Increased requirement for technology maintenance as more roads are being upgraded to Smart Motorway; • Impact of HS2 construction.

Field	Notes
	Roadspace use • Changes in delivery requirements such as the need for more roadspace for roadworker safety; • Less effective use of roadspace; • Very different ways of putting down pavement surfacing renewals, which are being considered. These may affect the current projection due to the large planned investment in pavement resurfacing over the first Road Period; • Absence of a hard shoulder on all lane running Smart Motorways, as the number of these is expected to increase over the first Road Period. The removal of conventional hard shoulder removes the opportunity to maintain the same number of running lanes during works by bringing the hard shoulder into use; • Opportunity: increase in occupancy efficiency may lead to an improvement in the measure. Reporting • Changes in levels of works recording accuracy leading to an apparent increase in works, which would not reflect real world changes in works placed; • Incorrect historical data (which may have affected the forecast); The transition to a new asset management system from the Schedule of Roadworks (SRW) system to the Network Occupancy Management System (NOMS) may yet affect the calculation of the metric and recording accuracy, and may shift the baseline. A combination of any or all of these factors could threaten the target. Highways England plans to re-run its forecasting regularly during the first Road Period, in order to see how roadworks delivery patterns are affecting the projected outcomes. It will also assess if factors that are not real-world changes in network roadworks occupancy under its control are having a significant effect which might cause it to seek a change in the target. Data quality improvements can also have unforeseeable effects on the levels of metrics, so assessments of this would want to be included in re-forecasts so as to inform any requests to adjust the target.
To reporting	Risks to reporting • Changes to the use of software systems as users become more familiar with the system. • Availability of specialist analytical staff in the agency and of external contractors involved in recording, maintaining and extracting records from the asset management system. Risks under the current methodology

Field	Notes
	• Timing of extracts. The data set used for the metric calculation is extracted from the asset management system (NOMS) using a predefined standard roadworks report run periodically. Roadworks being edited at the time of extraction may not be fully reflected in the data. As works are done on the network at any time of day, and updates to reflect the actual details of works deployed at any time are expected to be made in near real-time (there are no totally 'quiet times' when extracts can be taken). • Incorrect recording of roadworks. Data is entered by the maintenance agents in the supply chain, as part of their compliance to their contracts. There are associated risks relating to the availability and quality assurance of the data; as Highways England does not systematically check this data manually - this would cause costly double-handling of information in a way that it seeks to avoid in its contracts.

METHODOLOGY

Field	Notes
Unit of measure	Percentage 12 months rolling year including all time periods and days, calculated monthly.
Type of data	Asset data and roadworks transactions from the asset management system (NOMS).
Geographical coverage	The entire SRN
Baseline period	The forecast for the first Road Period was based on data from the time period between April 2012 to May 2014. March was excluded from this analysis as historically this month has been subject to compressed delivery to meet annual delivery targets.
Baseline value	During the baseline period the rolling year network availability was in the range between 98.08% and 99.33%.
Historical data	Monthly data from April 2006.
Methodology and calculation	*Data collection:* This measure presents the (running) lane availability of the SRN with respect to closures caused by roadworks. Data is sourced from the asset management system which captures roadworks recorded by the service providers. The availability of the motorway and A road network is measured by the percentage of lane-kilometre-days available. A lane is considered unavailable if it is closed to traffic because of roadworks recorded by

Field	Notes
	Highways England. A lane is still considered available if it has been narrowed or had temporary speed limits imposed. Lane closures caused by incidents are excluded, as are any other closures for non-roadworks reasons. A lane is considered added if it is brought into use during works to compensate for the closure of another lane. Hard shoulders used dynamically are not treated as running lanes for this availability calculation.
	Calculating the metric: A lane availability report is extracted monthly to show the total number of lane-kilometre-days on the network and the total number of lane-kilometre-days which were occupied by recorded roadworks. The measure is calculated as follows: • Availability percentage is calculated as: [Availability] = 100 x [Lane-km-days available] / [Total Lane-km-days] • For each month, the total lane-km-days are the lane lengths of all sections of the SRN multiplied by the number of days in the month. The data is extracted for permanent lanes from the asset management system: [Total Lane-km-days] = [Length of section (km)] x [Number of lanes] x [Number of days in the month] • All lanes are considered available unless they are closed to traffic because of roadworks: [Lane-km-days available] = [Total Lane-km-days] – [Roadworks] • Roadworks are extracted from the roadworks records on the asset management system: [Roadworks] are the lane-km-days not available because of roadworks as recorded by Highways England and its service providers. They are constructed from Summary and Detail records from the roadworks data depending on the required level of detail to describe the scheme. • Summary occupied lanes are calculated as: {[Number of Lanes Closed] – [Number of Lanes Added (typically by bringing the hard shoulder into use)]} x [Length of Works (km)] x [Duration of Closure (days)] • Detail occupied lanes are calculated as: {[Normal Running Lanes Closed] + [Number of lanes loaned (to the opposite carriageway)] – [Number of Lanes Added (typically by bringing the hard shoulder into use)] – [Number of Lanes Borrowed (from the opposite carriageway)]} x [Length of Works (km)] x [Duration of Closure (days)]

Field	Notes
Data collection frequency	Data are collected continuously via the asset management system, but collated and processed on a monthly basis. Reporting of availability takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data.
Validation/ cleansing	*Data collection:* Data are sourced from the asset management system which captures roadworks recorded by the service providers. The asset management system validates entries by the user to determine if the entry is consistent with the type of work being undertaken. There are requirements that this data is populated in advance of the works going ahead and that it is also updated when they commence and end.
	Calculating the metric: A lane availability report is extracted monthly to show the total number of lane-kilometre-days on the network and the total number of lane-kilometre-days which were occupied by recorded roadworks. The availability percentage is then calculated.
Data quality score	Data Quality Score: 2A The representativeness of the data is classed as 1. It is a contractual requirement that our supply chain enter any roadwork bookings onto NOMS. Failure to do this would potentially result in the undesirable occurrence of two different contractors potentially turn up to work on the same piece of road at the same time. The accuracy of the data is classed as 2. Data is entered into NOMS manually, as such there are associated risks relating to the quality assurance of the data. The asset management system validates entries by the user to determine if the entry is consistent with the type of work being undertaken. There are requirements that this data is populated in advance of the works going ahead and that it is also updated when they commence and end. NOMS data is subject to a range of data quality metrics examining timeliness and accuracy which are monitored to drive improvements. As such, the validity score is 2. The reliability of the data is classed as A, as the process of extracting the data from NOMS and turning into the availability metric is fully automated.

REPORTING

Field	Notes
Highways England reporting	Monthly (please note that data prior to April 2015 can be used to create a rolling year total in the first year of the first Roads Period).
Outside scope of assessment	Network Availability in time periods shorter than 12 months or on a subset of the SRN can be assessed, but are outside the scope of target. Loss of availability caused by anything other than scheduled roadworks is not in scope. (Incident management is covered by a separate KPI). Traffic management other than loss of lane availability (eg narrow lanes and temporary speed restrictions) are not in scope. Traffic effects (speed, flow, delay, diversions) as a consequence of loss of lane availability are not in scope.

APPROVAL PROCESS

Field	Notes
Accountable Director	Operations Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	More traffic places restrictions on the available working windows for short term works, and may result in works having to be placed more frequently	The relationship will depend very much on local conditions, and has not been studied to date in a way that might give a simple predictive relationship.	No management is in place at this stage.

KPI: The percentage of motorway incidents cleared within one hour

Narrative: Traffic Officers play an important role in keeping traffic moving; helping road users in the event of breakdown or collision and clearing debris from the motorways and returning the road to use. Highways England will demonstrate that it is clearing incidents as quickly as possible by reporting on incident management times. In addition, in line with the CLEAR (Collision, Lead, Evaluate, Act, Re-open) Initiative, Highways England will demonstrate that it is working with the other emergency responders including the police, ambulance, and fire and rescue services to improve incident response.
Definition: This measure relates to all incidents (an unplanned event such as a breakdown or collision) on the motorway network where a physical closure has occurred (this can be a lane closure, total motorway closure or a rolling closuring – all of which affect traffic flow). The duration of the closure (time from when the carriageway is impacted to time when all lanes are opened) is recorded and measured with a target of 85% of incidents cleared within one hour on a rolling 12 month basis.

KEY DEFINITIONS

RIF - Roads Information Framework – data warehouse containing command and control data
SQL - Structured Query Language

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	In any one rolling year, maintain performance of at least 85% of all motorway lane impact closures between 0600 and 2200 being cleared within one hour.
Measure of success	Success will be if the percentage of motorway lane impact incidents cleared in under an hour between 06:00 and 22:00hrs does not fall below 85% in any one rolling year. The rolling year average will be calculated each month using data from the preceding twelve months.
Assumptions	• Previous analysis has proved that the majority of motorway live lane impacting incidents with a clearance duration of one hour or less are often the responsibility of the Traffic Officer Service and rarely involve multiple agencies to clear the incident. • This measure only calculates the duration when a motorway lane impact closure of some level is in place and not the total time in which Traffic Officers are on scene or have responsibility for an incident; i.e. the measure starts when Highways England are made aware of an incident that impacts the motorway live lane(s).

Field	Notes
	• The measure includes all incidents that the Traffic Officers Service has an awareness of or involvement in, regardless of the level of response or attendance by Highways England. • Weather events, roadworks and administrative/observational logs that do not impact the live lane are excluded from the measure to ensure the indicator is based purely on live lane impacting incidents. • To align with the current Traffic Officer KPI's this measure only applies to incidents that occur between the hours of 0600 and 2200 when the effect upon the customer journey is at its greatest. • The incidents included in this metric occur on the motorway network, this includes the A282 Dartford Crossing / tunnel that completes the M25 loop. There are no current plans to extend the motorway network during the first Road Period. • Operations directorate (OD) resource funding is maintained to fund staff at existing levels • That there are no significant changes to the motorway network in terms of unexpected major infrastructure damage (e.g. bridge collapse). • That there are no significant changes to the motorway network caused by extraordinary natural phenomena (eg major flooding). • That there are no significant events such as national emergencies, terrorist events, industrial action, or national pandemics, which would affect the motorway network. • Roadworks over the first Roads Period will be managed to minimise the impact on network capacity and the ability of Traffic Officers to get to the scene of an incident. • The vehicle recovery contract, which is due to be re-let during the first Road Period, continues with the same contract and conditions as currently. • The measure of 85% is being achieved currently based on existing command and control data. It is not realistic to achieve 100% because of the nature of specific incidents. Incidents that involve police investigations, multiple vehicles and serious injury are usually police led and are most likely to last longer than one hour. • Each incident is recorded and counted separately; therefore multiple incidents will be counted individually.

Field	Notes
	• Where incidents do not meet this target further work to investigate will take place in each region to fact-find and learn lessons. • Major Projects directorate (MP) and Operations directorate (OD) will consult when planning their programmes to jointly minimise disruption and target Traffic Officer resource effectively. • All Lane Running Smart Motorways may increase the numbers of lane impacting incidents in some locations, because there are more live lanes. The quantum of this (as we only have two ALR sections and they're relatively new) is not yet fully understood. • New technology will deliver enhanced traffic management systems that reduce the impact of live lane incidents. • OD will be able to flex its operating model to increase network coverage and meet variations in network demand. • Existing legislation and licences allowing the use of the load cell, bull horn and alternating flashing headlamps will not change during the RIS period.
Organisational dependencies	• The Highways England vehicle recovery contract is actively managed and reviewed when necessary to achieve full potential. The vehicle recovery contract is due to expire and will be re-let during the first Road Period. • Traffic Officer incident management capability continues to be enhanced e.g. towing capability, righting of overturned vehicles. This capability is being trained out to Traffic Officers currently. • Impact of the increase of 560 miles of Smart Motorways across the network needs to be actively managed. • Highways England has a dependency on the asset support contractors where the asset has been affected and asset restoration is required, however this is most often in larger, longer lasting incidents which will normally not meet the target of one hour.
Government targets	N/A
External influences	Legislative changes, funding cuts to Highways England, funding cuts that impact on emergency services and service providers.

RISKS

Field	Notes
To meeting target	• Current funding provides for an on-road Traffic Officer Service targeted at motorways, with some presence on APTR such as the A1/A1M and A14, plus control room operations for the whole network, information provision to customers/partners and supporting activities to make the operation work. CSR10 reduces the budget for this operational activity from £135m in 09/10 to £85m in 14/15. Further reducing this funding would jeopardise incident response and operations of current and future Smart Motorways given the anticipated operational overhead. • The increase of some 560 miles of Smart Motorways (happening throughout the first Roads Period) across the network may have an impact on performance. Traffic Officers may also have difficulty getting through trapped traffic to reach incidents. • We will need to make sure our partners (e.g. emergency services and other road responders) are engaged to support achievement of targets as any funding cuts to the emergency services or service providers / asset support contractors could impact on our ability to achieve the target. Although by introducing the one hour clearance target this risk will be reduced as it is the two hour plus incidents where they have greater involvement. • Driver behaviour in complying with traffic signs (in particular the red X) will be a factor. Responses by traffic officers, emergency services and vehicle recovery are delayed when drivers block lanes that are closed by a red X. Ongoing information and awareness campaigns seek to address.
To reporting	Data is currently recorded on the Highways England command and control database, stored in the RIF and then retrieved using SQL by PAU's analysts and the target calculated. A potential risk has been identified where new project closure codes implemented post 2015 could be erroneously included in the data sets leading to inconsistent reporting. This is to be mitigated by excluding all project codes from the SQL query used to extract the data. Furthermore an Operational Development Improvement Group, made up of a number of Highways England key stakeholders, including the Performance Analysis Unit, are made aware of any requests for alterations and additions to the system. As part of the Common Highways Agency Rijkswaterstaat Model (CHARM) project, command and control and RIF is likely to be enhanced. However, basic requirements of this project should ensure the data

Field	Notes
	required to calculate this target remain available and therefore we do not anticipate seeing a step change in the data - OD are working closely to ensure these requirements are built into enhanced system.

METHODOLOGY

Field	Notes
Unit of measure	Percentage of incidents that comply to the filters (see methodology and calculation) achieving a lane impact closure duration of one hour or less on a rolling 12 month basis Monthly data, Monday-Sunday (inclusive) between hours 0600 and 2200. Any incident that starts during these hours will be counted in this measure, regardless of finish time (eg if an incident starts at 2130 and ends at 2220 it will be counted). Incidents that start outside of this time and finish within this time will not be counted (eg if an incident starts at 0530 and ends at 0620 it will not be counted).
Type of data	Command and Control Data - Command and Control data is retrieved from RIF using SQL. It is placed into excel then manually analysed and the percentage of incidents within the specified filters/time is calculated. We will include those incidents occurring in sections of roadworks where free recovery is provided by the scheme.
Geographical coverage	Motorways only, this includes A-roads classified as motorways, including the A282 Dartford Crossing / tunnel that completes the M25 loop. There are no current plans to extend the motorway network.
Baseline period	April 2013 – March 2014
Baseline value	April 2013: 87.2% May 2013: 86.7% June 2013: 86.4% July 2013: 85.2% Aug 2013: 86.1% Sept 2013: 85.2% Oct 2013: 84.9% Nov 2013: 85.8%

<table>
<tr><th>Field</th><th>Notes</th></tr>
<tr><td></td><td>Dec 2013: 85.0%
Jan 2014: 85.0%
Feb 2014: 85.7%
Mar 2014: 87.4%</td></tr>
<tr><td>Historical data</td><td>Command and control data required to calculate this new measure can be retrieved back to August 2010
<table>
<tr><th>Calendar Year</th><th>Number of Closure Impact Incidents cleared within 1 hour</th><th>% Closure Impact Incidents Cleared within 1 hour</th></tr>
<tr><td>2011</td><td>31,842</td><td>86.9%</td></tr>
<tr><td>2012</td><td>31,517</td><td>84.8%</td></tr>
<tr><td>2013</td><td>31,203</td><td>85.7%</td></tr>
<tr><td>2014</td><td>36,906</td><td>86.2%</td></tr>
</table></td></tr>
<tr><td>Methodology and calculation</td><td>Data collection: All motorway incidents are entered onto command and control by Traffic Officer control room staff. The following filters are then applied to select incidents which enable the measure to be calculated and target performance ascertained:
Only incidents between 0600 and 2200.
Only incidents where a physical closure has been recorded (based on closure codes).
Weather events, roadworks, network monitoring (e.g Abnormal Loads) and infrastructure defect logs are excluded (based on final closure code).
Project codes are also excluded from the data set. These are bespoke temporary codes that are used to record specific occurrences on the SRN further to the existing list of codes. For example to capture the escort of hazardous loads on the Dartford Crossing.
A physical closure can range from a one lane closure to a complete motorway closure (both carriageways) but also includes where a rolling block is used as this stops the traffic, and a red X sign which tells motorists the lane is closed</td></tr>
</table>

Field	Notes
	Calculating the metric: The measure is calculated each month by comparing the number of filtered incidents which had an impact duration of one hour or less, with the total number of filtered incidents. The rolling year figure is calculated by totalling the same data over the preceding twelve months and then calculating the percentage that were cleared within an hour. We will report both the rolling 12 month score and the in - month score in each reporting period.
Data collection frequency	The data can be provided on a weekly basis.
Validation/ cleansing	*Data collection:* Internal management of the accuracy of data being recorded by operators at source is conducted daily by Traffic Officer control room management. The Performance Analysis Unit conducts quality and consistency checks on the command and control data on a monthly basis. This is not a formal process.
	Calculating the metric: The central office notifies regional centres of incidents that are reported as lasting over five hours – regional checks take place and corrections are made as necessary.
Data quality score	B3 Command and control system is an incident management system and is not designed for data and statistical purposes. Command and control data is retrieved from RIF using SQL. It Is placed into excel then manually analysed and the percentage of incidents within the specified filters/time is calculated. Due to the nature of this data being manually entered there is also a margin for human error however this is a system that has been used over 10 years by experienced operators.

REPORTING

Field	Notes
Highways England reporting	End of each calendar month to provide previous months performance i.e. end of May 2015 will provide April 2015 data. This ensures enough time for the data to be available to analysts to complete the calculations.
Outside scope of assessment	Incidents that occurred off the motorway network, outside the stated hours and that do not comply with the filters. • Incidents that start outside of 0600 – 2200. • Logs that do not relate to lane impact incidents e.g. weather logs. • Any closure codes that have been initiated post April 2015 for example as part of an ongoing project within Highways England.

APPROVAL PROCESS

Field	Notes
Accountable Director	Operations Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
KSIs KPI	An increase in traffic levels may result in an increase in incident numbers. If this number increases the number of incidents cleared within an hour will be impacted as such incidents invariably take over one hour to clear.	Exact linkage is currently undefined.	No management is in place at this stage.
Network availability KPI	If network availability falls this could result in an increased number of incidents and delays in reaching incidents that have occurred on the network	Exact linkage is currently undefined.	No management is in place at this stage.
Amount of traffic PI	Increased traffic volumes could lead to increased incident numbers and delay responses to incidents that have occurred on the network	Exact linkage is currently undefined.	No management is in place at this stage.
Savings KPI	Cost savings could affect future incident management development and capability	Exact linkage is currently undefined.	No management is in place at this stage beyond identified need for an impact assessment and necessary discussions should cost savings/cuts be made

PI: Planning Time Index (reliability of journeys)

Narrative: Highways England should also provide a suite of PIs to help inform and evaluate what it is doing to improve traffic flow, this should include a PI or PIs to demonstrate the reliability of journey times.
Definition: This measure is designed to indicate how much additional time road users need to allow to ensure they arrive on time. It highlights roads where very slow journeys are encountered. This measure is the ratio of the 95%ile journey time to the free-flow journey time.

KEY DEFINITIONS

NTIS - National Traffic Information Service – a service provided by Network Information Services. There is a NTIS based network – a data warehouse containing traffic data.
MIDAS - Motorway Incident Detection and Automatic Signalling – system for detecting queuing traffic and alerting drivers approaching queueing traffic.
TMU - Traffic Monitoring Unit: Counting loop in the pavement which counts traffic.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	A low planning time index means that a road delivers a consistently good journey time. It measures the more extreme end of the journey time distribution, and so will reflect those who have the worst journey time experience.
Assumptions	This note assumes that: • ; • the measure will be calculated initially from TrafficMaster GPS data, using journey times from individual vehicle link/section transit times for cars only; • free-flow speeds calculated from historical data are appropriate and can still be applied following the transition to the new reference network. It is expected that any changes to free flow speeds other than resulting from road schemes (for example from a faster car vehicle fleet, large and continued fuel price changes or social changes) will be either relatively small or else take effect slowly; • a suitable source of individual-vehicle journey time data (such as TrafficMaster GPS) will be available throughout the first Road Period; • sample-based journey time data (such as TrafficMaster GPS) is sufficiently accurate to capture

Field	Notes
	planning times and calculate the planning time index reliably; • the reliability measured for cars will also reflect the reliability experienced by other vehicle types. (The measure will be based on data from cars only. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the TrafficMaster sample, which we know changes over time, and introduce artefacts. Using cars ensures that we measure the performance of the road rather than of speed limiters installed in other vehicle types. We do not expect speed limiters to be installed in cars, or that technologies such as intelligent speed adaptation to speed limits will have any significant effect in the RIS period); and, the slowest journeys and lowest reliability are usually encountered during day times. (The measure will be based on daytime data only, 06:00 – 20:00. This avoids the time periods with the lowest sample sizes). The planned data source property of delivering individual vehicle speed readings, from a known vehicle type is highly desirable. (Other suppliers of individual vehicle journey times could be used subject to availability) No compensatory factors such as traffic growth assumptions have been included in this measure. It does not in itself differentiate between causal factors of significant delay to drivers (such as recurrent congestion, incidents, roadworks, weather, or local factors).
Organisational dependencies	This indicator will be affected directly by the requirement to deliver increased capital investment and maintenance on the Strategic Road Network (SRN) - a higher volume of roadworks will increase planning time (95th percentile journey time) on many roads. Minimising the impact of works on the slowest journeys will depend on working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely, and so as to achieve the availability KPI target and minimise average delay. Improvements in the planning time index depend on successful delivery of schemes aimed at improving the slowest journeys and reducing congestion. Most road improvement schemes carried out under economic cost/benefit analysis - which are dominated by driver time savings - should be of this nature. It will also be affected to a small extent by incident management. Schemes with different purposes such as improving safety, supporting environmental or accessibility objectives, or increasing capacity within the existing roadspace by use of technology may increase the planning time depending on the design of the specific schemes.
Government targets	N/A
External influences	This measure is sensitive to external influences outside the control of Highways England, most importantly weather and changes in demand. An increase in the number and severity of incidents may also cause a

Field	Notes
	deterioration of the measure. An increase in the number of speed-limited vehicles may also deteriorate the measure, if this causes slower speeds for cars travelling on the same roads. The measure may be affected by changes in the working practices in the supply chain. Legislative or other restrictions on the Highways England limiting flexibility in the delivery of works and traffic management could influence the measure. Requirements to deliver more works than anticipated would cause deterioration of the measure. Temporary speed limits (eg for air quality improvements) would cause a deterioration of the measure.

RISKS

Field	Notes
To meeting target	There is no target against this measure, however the key risks that may cause a deterioration of this measure are: • weather (in particular extended and widespread periods of rain and snow fall); • roadworks to deliver an increased investment programme; • traffic growth causing additional congestion; • frequency and severity of incidents; and, • changes to the road network carried out for reasons other than improving journey times, eg safety schemes.
To reporting	• • Continued availability of the GPS data, or a near equivalent to provide journey time data of individual non-speed limited vehicles on all strategic roads.

METHODOLOGY

Field	Notes
Unit of measure	Index [Daytime only (06:00 – 20:00)]
Type of data	Journey times from individual vehicles and traffic flow; sourced from Highways England's own measurement devices, eg electromagnetic loops in the road surface (for traffic flow), and from third parties (for journey time - currently Teletrac Navman).
Geographical coverage	All roads on the SRN where sufficient data is available
Baseline period	April 2015 – March 2016
Baseline value	1.66
Historical data	From January 2009
Methodology and calculation	*Collecting the data:* • The raw journey time data consists of individual observations from vehicles with GPS satnav devices installed, at 10 second intervals. • Flow data are obtained from flow counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link where multiple counters are available on a road link.
	Calculating the metric: • For each road link or section: Planning Time Index = Planning Time / Free-flow journey time • Free-flow journey times are calculated from data for cars only. We are not proposing to update free-flow journey times during the first Road Period, except in exceptional circumstances which may include an upgrade of road class that would cause a link to receive a new reference number in the network definition. • Planning Time is the 95th percentile journey time measured on each road link or section. Each journey time observation is weighted by an appropriate average expected flow value, ie the planning time is a flow-weighted percentile, not simply a percentile of the number of observations in the data. • Expected Flow is currently calculated as a combination of flows measured in the given 15-minutes and similar time periods. Expected rather than observed flow is used to avoid under-weighting during incidents or diversions. • Only observed journey times are used. There is no infilling of time periods without observed data, so that the observed distribution of journey times is not distorted when this distribution-based metric is

Field	Notes
	calculated for each month and link. The Planning Time Index for the SRN is calculated as the weighted average of the Planning Time Indices for all road links or sections.
Data collection frequency	Journey time and flow data are collated and processed on a monthly basis. Reporting generally takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data. Much of the flow data is collected in real-time using fully automated mechanisms, but the delivery time of other data is dependent on various contracts with different time criteria. Collection in arrears also allows for data delayed in the online collection network because of local short-term connectivity issues.
Validation/ cleansing	*Data collection:* Teletrac Navman GPS data The raw data consists of individual observations from vehicles with GPS satnav devices installed, at 10 second intervals. In order for any particular vehicle's journey to be accepted, the following conditions must be satisfied: • the start and end of each measurement network link is associated with 300m virtual square boxes - the vehicle must be observed in the start box and, sometime later, in the end box; • no more than 10% of the expected observations in between must be missing (this percentage is adjusted if there is a tunnel or other known obstruction on the link; • the calculated speed based on the start and end times, and link length must be within a specified tolerance of the average spot speeds observed along the link, in order to reject journeys where the vehicle took an alternative route (a route that was not wholly on the SRN). (The actual tolerance used is dependent on the link); • some specific links are filtered out if they are known to be parallel to another road; • only observations from cars are used. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the Teletrac Navman sample and introduce artefacts. Flow data

Field	Notes
	Flow data are obtained from flow counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link where multiple counters are available on a road link. Validation is carried out to check that counts are consistent along a journey so that, for example, the sum of slip road and interslip counts is equal to the count on the main carriageway.
	Calculating the metric: The metric is calculated using a series of automated calculations.
Data quality score	Data quality considerations for the Teletrac Navman (formerly TrafficMaster) GPS data: • Teletrac Navman GPS data: data source for the on time reliability measure (National Statistic as at March 2015); • Data are from a sample of vehicles only. Sample sizes can be very small for peripheral parts of the network or at quiet times of the day; • The sample is not randomly selected and may be biased. In particular it tends to reflect the journeys of business drivers. Care needs to be taken with the vehicle type composition of the sample changing over time, which is one reason why the preference is to use data from cars only [avoiding speed limiter effects being the other]; • Raw data from individual vehicles is collected by a third party (Teletrac Navman); • Data are processed to calculate link transit times; • There are some known difficulties in calculating accurate link transit times from GPS data for links that are very short or that run very close to other roads; • The restriction to cars-only data from the Teletrac Navman dataset relies on correct vehicle classification; • As the data are independent of that produced by in-road devices it gives good quality data during roadworks, where other in-road or roadside devices are often compromised (eg traffic is moved on to a contraflow, and so is not where fixed measurement devices expect it to be) or removed by the works (typically loops are planed out or roadside cabinets decommissioned); • The data are not compromised by roadside maintenance. By contrast a small percentage of data from roadside devices is compromised by maintenance actions – such errors are not easy to detect, and can persist for a while before detection;

Field	Notes
	• The data are based on individual vehicles. The full speed distribution is available as is the origin/destination track of vehicles (truncated – start and end removed for privacy reasons). This makes this data suitable for a variety of analyses. The data is nationally available, allowing for comparisons with local roads to be developed; • Pragmatically speaking, Highways England analysts have found this data source to give consistent and stable results with few artefacts. <u>Data quality considerations for the flow data:</u> • Flow data are taken from counting devices, such as loops in the road; • Flows on each road link is usually measured based on a single device located along the link; • Flow data on individual links can be compromised if measurement devices fail (eg flows in one lane may no longer be recorded if the relevant loop fails) or if measurement devices are not correctly assigned to the link; • By using expected flow (rather than observed flow) in each 15-minute period, under-recording of delay during incidents is avoided. Given the information above and in the validation/cleansing field, a Data Quality Score of 2A is given The representativeness of the data is classed as 2: the flow data is deemed as representative, although devices may fail and miss vehicles. The Traffic Master GPS data covers all but a few exceptional links, although as noted above, the sample may be biased. The accuracy of the data is classed as 1: flow data is deemed very accurate at a national level, and the Traffic Master GPS data only has some issues for links that are very short or that run very close to other roads, and also some infilling of data. As such, the validity score is 2. The reliability of the data is classed as A, as the process is fully automated.

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of assessment	Journey times of vehicle types other than cars. (It is assumed that the reliability measured for cars will also reflect the reliability experienced by other vehicle types).

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels will result in an increase in planning time	We do not currently have an established general relationship. Highly loaded sections of the network are likely to show a large response to traffic growth.	No management is in place at this stage.

PI: Traffic (vehicle miles travelled) on the SRN

Narrative: Highways England should also provide a suite of PIs to help inform and evaluate what it is doing to improve traffic flow, though the Government recognise that several factors, such as traffic volumes, are not within their control.
Definition: Traffic (total vehicle miles) on the Strategic Road Network (SRN) is collected via automatic and manual counters. The amount of traffic on the SRN is reported retrospectively on an annual basis via the validated count data, which is released by the Department for Transport (DfT) in June each year. The annual report entitled 'Road Traffic Estimates in Great Britain' provides a breakdown of the data by motorway and All-Purpose Trunk Roads (APTR). In addition, this publication also includes breakdowns for traffic on motorways and APTR by vehicle type, and by region.

KEY DEFINITIONS

TRAFFIC - Vehicles moving on a public highway. The measurement method is set out in the document below.
VEHICLE MILES - One vehicle travelling one mile each day for a year would equal 365 vehicle miles.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	This measure provides a good indication of how well the SRN is meeting its fundamental purpose. It is designed and built to permit high volume, fast traffic movements. An increase in the measure represents a successful outcome in the context that the network is facilitating more traffic movements.
Assumptions	N/A
Organisational dependencies	Improving traffic flow is dependent on: • The delivery of associated Major Projects directorate (MP) and Operations directorate (OD) schemes; • Completing the maintenance programme (OD); • Effective incident management, and the reduction of incidents (Operations directorate) • Effective information provision to drivers to help avoid traffic hot spots (Operations directorate).
Government targets	N/A
External influences	Traffic volumes are influenced by many factors including: economic growth, local changes in travel patterns, increased development near the SRN, weather, cost of driving, the investment programme, and developments in other transport modes.

RISKS

Field	Notes
To meeting target	N/A
To reporting	• The continued availability of the DfT Road Traffic data, or a near equivalent, to provide traffic data on all strategic roads is a key requirement for this indicator. The DfT Road Traffic data is also used to report estimates of road traffic on all roads in Great Britain, and DfT have published such estimates since the 1950s. These are National Statistics, produced to high professional standards as set out in the Code of Practice for Official Statistics. They undergo regular quality assurance reviews, and publication schedules are announced for the 12 months ahead. Under the Code of Practice, statisticians need to consult users before making changes that affect statistics or publications. • The DfT traffic data are obtained via contracts for enumerator data collection and contracts for the maintenance/deployment of automatic traffic counters. The current contracts run until end 2017, but DfT expects to continue to need to collect traffic data for the National Statistics publication- DfT Road Traffic Estimates have been published since the 1950s. • There will be challenges in the ability to drill down from other traffic measures into this traffic flow data, as it will be collected independently from the rest of the Highways England flow data. At the headline level this is unlikely to make a great difference, but for consistent local analyses (eg exploring exceptions in performance on certain links/routes) comparing numbers of metrics, Highways England are likely to have to use their own data. [DfT statisticians and Highways England analysts have proposed a joint project to explore any differences between the DfT traffic data (used for this PI) and Highways England's own flow data. The aim of this project would be to eventually report this PI metric using the current DfT traffic data combined with Highways England's flow data, and potentially on a more frequent basis, and so mitigate this last risk to reporting].

METHODOLOGY

Field	Notes
Unit of measure	Total vehicle miles travelled for the whole of the calendar year (1 January to 31 December)
Type of data	Vehicle Miles travelled: Supplied by DfT Road Traffic Estimates, which are calculated from manual traffic counts (combined with automatic traffic counts) and road length statistics. The manual count data are collected by DfT (DfT contract enumerators to conduct the counts) on a rolling census approach across the SRN. Breakdowns available include: vehicle miles travelled on the SRN by vehicle type, road type, region, and

Field	Notes
	local authority. In addition, traffic flows for each junction-to-junction link of the motorway and APTR are also published annually.
Geographical coverage	All roads on the SRN as at 1st April in the given year.
Baseline period	2013 calendar year. [2014 due to be published on 21 May 2015].
Baseline value	2013 calendar year = 85.5 billion vehicle miles travelled (137.5 billion vehicle kilometres travelled). [2014 due to be published on 21 May 2015].
Historical data	Data available for the SRN from 2000.
Methodology and calculation	*Data collection:* A full set of guidance notes setting out the methodology for producing Road Traffic Estimates are published in the document "Annual road traffic estimates: methodology note" found here: https://www.gov.uk/government/publications/road-traffic-speeds-and-congestion-statistics-guidance (this guidance note is valid but this suite of documents is currently being combined).
	Calculating the metric: To calculate the National, and SRN, Road Traffic Estimates, DfT take the flow figures (validation as set out above) for each junction-to-junction link of the network. This flow is then multiplied by the length of the link, and by 365, to estimate the number of vehicle miles that have been travelled on that link over the whole year. The figures for all links on the SRN are then added together.
Data collection frequency	Data are collected during each year via manual traffic counts; these occur on a weekday, outside of school and bank holidays between March and October, at a sample of sites (a stratified sample on a rolling Census basis) across the entire road network. Each year the sample includes over a third of all junction-to-junction road links on the SRN (ie the entire SRN road network is counted over a three-year period). Collation, validation, analysis, and reporting takes five months.
Validation/ cleansing	*Data collection:* National, and SRN, Road Traffic Estimates are validated by DfT as part of production of the National Statistics publication. This includes: • The validation of the raw flow data (both from manual and automatic sources) occurs at an hourly and daily level, by direction of flow and by vehicle type. This occurs firstly through a database which has automated validation routines through which all flow data is passed. Secondly, a visual inspection via a charting-tool is made against flows from previous years' data for the same location. Further routine checks occur throughout processing to ensure there are no data transfer errors, etc.

Field	Notes
	• To ensure that each junction-to-junction link of the motorway and 'A' road network has a vehicle flow estimate for an average day in each year, flows for road links that have not been sampled in the given year, and any invalid data identified through the validation routines above, are imputed. The flow on these links is calculated by taking the flow figures from the previous year for the link, and multiplying this by a weight. The weight is the percentage change in flows since the previous year, on roads in the same sample stratum as the given road link, and are produced from the data from DfT automatic traffic counters. • The road length data are taken from the DfT major roads database, which is one of the sources that are used for the annual publication of Road Length statistics for all roads in Great Britain. The DfT major roads database is sourced primarily from Ordnance Survey's Integrated Transport Network, which is regularly maintained and updated. Differences between the Ordnance Survey's network and Highways England's network are also investigated as part of the validation of the DfT major roads network.
	Calculating the metric: Most validation is done at link level. National, and SRN, Road Traffic Estimates are validated by DfT as part of production of the National Statistics publication.
Data quality score	Data Quality Score: 2A The representativeness of the data is classed as 1. Traffic estimates are produced for every junction-to-junction link of the SRN – ie they cover 100% of the network each year. They are produced using observations collected on a rolling-Census approach, with a statistical methodology in place to produce estimates for links that are not in the sample for the given year. The accuracy of the data is classed as 2. The data collection methods have been assessed to be at least 90% accurate in GB and international trials and we would expect the England-level SRN traffic estimate to be higher than this. However, error estimates are not currently produced for calculated aggregate traffic estimates. Some internal work has suggested that estimates of the flow at a junction-to-junction-link-level have 95% confidence limits of +/- 20%. Hence, a conservative score on accuracy is 2. The reliability of the traffic estimates is classed as A. The process is sound, with the methodology used well established and internationally recognised. Errors in calculation are minimal, and quality assurance and checking is an important part of the National Statistics process of producing traffic estimates.

REPORTING

Field	Notes
Highways England reporting	Reported annually in June
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director
Delivery Manager	Performance Analysis Unit Team Leader (please note that as the Road Traffic Statistics Department in DfT provide this data, the Performance Analysis Unit Team Leader can report this data, but Highways England is reliant on the data provided by DfT).

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude /quantum of the link)	How any links are managed
Incident Numbers PI Incident Management KPI	If the number of incidents reduces, and the percentage of incidents cleared in an hour increases, traffic flow may increase.	Exact linkage is currently undefined.	No management is in place at this stage.
Delivery Plan KPI	Completion of Investment Plan schemes may increase the traffic PI.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Acceptable Journeys

Narrative: Highways England should provide a suite of PIs to help inform and evaluate what it is doing to improve traffic flow.
Definition: Proportion of journeys faster than 3/4 of the 'free flow' journey time, calculated as a percentage.

KEY DEFINITIONS

FREE FLOW SPEED- is calculated as the 85%ile of car speeds for a link, taken over a long term period [so that the effects of long term roadworks are eliminated]. Free flow speeds are capped at the speed limit. The free flow journey time is the journey time at the free flow speed.
The definition is framed in 'journey time' terms to avoid aggregation problems associated with averaging speed based averages, but effectively reflects journeys that are at ¾ of the free flow speed or better. So for a 70mph speed limit motorway this would reflect speeds 52.5mph or more.
This is a pragmatic measure, also known as the 'reliability rating' in Transportation Research Board literature, designed to reflect journeys that drivers have undertaken on roads that are performing effectively, and so that they should find generally acceptable. This should not be taken as a statement that journeys at this threshold will all be 'good' journeys from a customer point of view. Journeys that are not faster than 3/4 of the free flow journey time will generally have been subject to some degree of congestion or incident effect.
NTIS - National Traffic Information Service – a service provided by Network Information Services. There is a NTIS based network – a data warehouse containing traffic data.
MIDAS - Motorway Incident Detection and Automatic Signalling – system for detecting queuing traffic and alerting drivers approaching queueing traffic.
TMU - Traffic Monitoring Unit: Counting loop in the pavement which counts traffic.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	A high proportion of journeys above the threshold journey time will reflect road performance that is largely unaffected by significant congestion or incident effects.
Assumptions	This note assumes that: • the measure will be calculated initially from TrafficMaster GPS data, using journey times from individual vehicle link/section transit times for cars only. (Other sources of individual vehicle journey times could be used);

Field	Notes
	• the free-flow speeds calculated from historical data are appropriate and can be still be applied following the transition to the new reference network; • a suitable source of individual-vehicle journey time data (such as TrafficMaster GPS) will be available throughout the first Road Period; • the sample-based journey time data (such as TrafficMaster GPS) is sufficiently accurate to calculate this metric reliably; • the performance measured for cars will also reflect the performance experienced by other vehicle types. (The measure will be based on data from cars only. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the TrafficMaster sample and introduce artefacts.); • the slowest journeys are usually encountered during day times. (The measure will be based on daytime data only, 06:00 – 20:00. This avoids the time periods with the lowest sample sizes.); and, • this metric is an effective measure of road user experience.
Organisational dependencies	• This will be affected directly by the requirement to deliver increased capital investment and maintenance on the Strategic Road Network (SRN): a higher volume of roadworks with temporary speed limits will decrease the proportion of acceptable journeys. Minimising the impact of works on journey times will depend on working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely, and so on as to achieve the availability KPI target and minimise average delay. • Improvements in this metric depend on successful delivery of schemes aimed at reducing congestion and effective incident management. Schemes with different purposes such as improving safety, supporting environmental or accessibility objectives, or increasing capacity within the existing roadspace by use of technology may reduce this measure depending on the design of the specific schemes.
Government targets	N/A
External influences	see the note for the Planning Time Index PI

RISKS

Field	Notes

Field	Notes
To meeting target	see the note for the Planning Time Index PI
To reporting	see the note for the Planning Time Index PI

METHODOLOGY

Field	Notes
Unit of measure	Percentage [Daytime only (06:00 – 20:00)]
Type of data	see the note for the Planning Time Index PI
Geographical coverage	All roads on the SRN where sufficient data are available
Baseline period	April 2015 – March 2016
Baseline value	83.58%
Historical data	From April 2008
Methodology and calculation	*Data collection:* • The raw journey time data consists of individual observations from vehicles with GPS satnav devices installed, at 10 second intervals; • Flow data are obtained from flow counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link where multiple counters are available on a road link.
	Calculating the metric: • For each road link: [Proportion of Acceptable Journeys] = [Traffic faster than 3/4 of the free flow journey time] / [All Traffic] • If the observed journey time is faster than 3/4 of the free flow journey time for the given link then all of the apportioned expected flow is considered acceptable and is included in the numerator of the calculation; • The metric for the SRN is calculated as the weighted average (by vehicle miles) of the values for all road links or sections; • Traffic for each road link and 15-minute time period is the product of expected flow and the length of the link; • Free-flow journey times: The 'free flow' speed is calculated as the 85%ile of car speeds for a link, taken over a long term period [so that the effects of long term roadworks are eliminated]. The free

Field	Notes
Unit of measure	Percentage [Daytime only (06:00 – 20:00)]
	flow journey time is the journey time at the free flow speed; • Expected flow is currently calculated as a combination of flows measured in the given 15-minutes and similar time periods. Expected rather than observed flow is used to avoid under-weighting during incidents or diversions; • The apportioned expected flow for each link or section and each 15-minute period is the total expected flow apportioned equally to each individual journey time record observed on the given link and 15-minute period. Note that this flow will include all vehicle types; Time periods without observed data are infilled with the monthly average value of this metric for the link, ie for link ABC123 in December 2016 any time periods without data are infilled with the monthly average value for link ABC123 calculated for the whole of December 2016. Infilling with the average in this way ensures that periods with missing data have a generally neutral effect. If there are links which have a large number of missing periods after this process, it is to be confirmed whether these links should be excluded or filled in with a different representative average. Note that speeds are measured using cars, as this gives results that are not affected by speed limiters fitted to other vehicle types. Including other types of vehicle might result in measured speeds that do not reflect the real performance of the road. So car speeds are measured as being representative of the performance of the road, and then flow weighting is applied using all vehicle types to allow values from different road links to be combined.
Data collection frequency	See the note for the Planning Time Index PI
Validation/ cleansing	See the note for the Planning Time Index PI
Data quality score	See the note for the Planning Time Index PI

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of	Journey times of vehicle types other than cars - It is assumed that the performance measured for cars will

Field	Notes
assessment	also reflect the road user experience for other vehicle types.

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels will result in an increase in congestion and reduction of this metric.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Average Speed

Narrative: Highways England should also provide a suite of PIs to help inform and evaluate what it is doing to improve traffic flow
Definition: The average speed of car journeys on the Strategic Road Network (SRN).

KEY DEFINITIONS

Speed is calculated as the vehicle mile weighted harmonic mean of car speeds. Car speeds are measured to avoid vehicle type mix and speed limiter effects.
NTIS - National Traffic Information Service – a service provided by Network Information Services. There is a NTIS based network – a data warehouse containing traffic data.
MIDAS - Motorway Incident Detection and Automatic Signalling – system for detecting queuing traffic and alerting drivers approaching queueing traffic.
TMU - Traffic Monitoring Unit: Counting loop in the pavement which counts traffic.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	Average car speeds reflect the speed at which typical journeys can be made on the SRN. Increasing average speeds will reflect a network where the road quality is being improved and effects of congestion generally avoided. Decreasing average speeds will reflect a network where congestion effects are generally increasing, or where construction work is increasing. However there are many reasons for changes in speed in addition to network quality, capacity or roadworks – weather, traffic growth, speed limit compliance, social changes, increased proportion of heavy goods vehicles on the road, and more.
Assumptions	This note assumes that • the measure will be calculated initially from TrafficMaster GPS data, using journey times from individual vehicle link transit times for cars only (Other sources of journey times from individual vehicles could be used); • a suitable source of journey time data (such as TrafficMaster GPS) will be available throughout the first Road Period; • the sample-based journey time data (such as TrafficMaster GPS) is sufficiently accurate to calculate this metric reliably; • the performance measured for cars will also reflect the trends in speeds experienced by other vehicle

Field	Notes
	types. (The measure will be based on data from cars only. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the TrafficMaster sample and introduce artefacts).
Organisational dependencies	This will be affected directly by the requirement to deliver increased capital investment and maintenance on the SRN: a higher volume of roadworks with temporary speed limits will reduce average speeds. Minimising the impact of works on journey times will depend on working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely, and so as to achieve the availability KPI target. Improvements in this metric depend on successful delivery of schemes aimed at reducing congestion and effective incident management. Schemes with different purposes such as improving safety, supporting environmental or accessibility objectives, or increasing capacity within the existing roadspace by use of technology may reduce average speeds.
Government targets	There is no associated government target.
External influences	See the note for the Planning Time Index PI.

RISKS

Field	Notes
To meeting target	There is no target associated with this measure. However the key risks that may cause a reduction in speed are: • Weather (in particular extended and widespread periods of rain and snowfall); • Roadworks to deliver an increased investment programme; • Traffic growth causing additional congestion; • Growth in the percentage of speed limited vehicles on the network; and, • Changes to the road network carried out for reasons other than reducing delay [typically safety schemes, schemes prioritising pedestrians in towns, some schemes prioritising flow increases etc.];
To reporting	• Continued availability of the TrafficMaster GPS data, or a near equivalent to provide journey time data on all strategic roads.

METHODOLOGY

Field	Notes
Unit of measure	Miles per hour
Type of data	Journey times from individual vehicles, and traffic flow sourced from Highways England's own measurement devices and from third parties (currently including Teletrac Navman (formerly)).
Geographical coverage	All roads on the SRN where sufficient data is available
Baseline period	April 2015 – March 2016
Baseline value	59.3 mph
Historical data	From January 2009
Methodology and calculation	*Data collection:* • Speeds are collected from Traffic Master GPS data. The raw data consists of individual observations from instrumented vehicles at 10 second intervals; • Flow data are obtained from traffic monitoring unit (TMU) or MIDAS counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link.
	Calculating the metric: • Average speed is calculated as the vehicle-mile weighted harmonic mean; • Average speed = sum over all 15 minute periods of ([Length of link] * [Expected Flow]) / sum over all 15 minute periods of ([Journey Time] * [Expected Flow]) • Expected flow: see the note for the Planning Time Index Time periods without observed data are infilled with the average journey time from 1 or 2 periods either side of the period required. Time periods without data after this process are infilled with the monthly average value of this metric for the link by day and night, ie for link ABC123 in December 2016 any night time periods without data would be infilled with the monthly night time average value for link ABC123 calculated for the whole of December 2016. Infilling with the average in this way ensures that periods with missing data have a generally neutral effect. If there are links which have a large number of missing periods after this process, it is to be confirmed whether these links should be excluded or filled in with a different representative average.

Field	Notes
Data collection frequency	Journey time and flow data are collated and processed on a monthly basis. Reporting generally takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data.
Validation/ cleansing	*Data collection:* Teletrac Navman (formerly TrafficMaster) GPS data The raw data consists of individual observations from instrumented vehicles at 10 second intervals. In order for any particular vehicle's journey to be accepted, the following conditions must be satisfied: • The start and end of each link is associated with a 300m square box centred on the start and end point. The vehicle must be observed in the start box and, sometime later, in the end box; • No more than 10% of the expected observations in between must be missing (this percentage is adjusted if there is a tunnel or other known obstruction on the link; • The calculated speed based on the start and end times and link length must be within a specified tolerance of the average spot speeds observed along the link, in order to reject journeys where the vehicle took an alternative route. (The actual tolerance used is dependent on the link); • Some specific links are filtered out if they are known to be parallel to another road; and, • Only observations from cars are used. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the Teletrac Navman sample and introduce artefacts including variations over time that are not related to road performance. It is also highly desirable that the effects of speed limiters are excluded, which is a benefit from using car data alone. Flow data Flow data are obtained from traffic counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link. Validation is carried out to check that counts are consistent along a journey so that, for example, the sum of slip road and interslip counts is equal to the count on the main carriageway.
	Calculating the metric: The metric is calculated using a series of automated calculations.
Data quality score	Data quality considerations for the Teletrac Navman (formerly TrafficMaster) GPS data: • Teletrac Navman GPS data: data source for the on time reliability measure (National Statistic as at March 2015);

Field	Notes
	• Data is from a sample of vehicles only. Sample sizes can be very small for peripheral parts of the network or at quiet times of the day; • The sample is not randomly selected and may be biased. In particular it tends to reflect the journeys of business drivers. Care needs to be taken with the vehicle type composition of the sample changing over time, which is a reason why only cars are included in this measure; • Raw data from individual vehicles is collected by a third party (Teletrac Navman); • Data is processed to calculate link transit times; • There are some known difficulties in calculating accurate link transit times from GPS data for links that are very short or that run very close to other roads; • The restriction to cars-only data from the Teletrac Navman dataset relies on correct vehicle classification; • As the data is independent of that produced by in-road devices it gives good quality data during roadworks, where other in-road or roadside devices are often compromised (eg traffic is moved on to a contraflow, and so is not where fixed measurement devices expect it to be) or removed by the works (typically loops are planed out or roadside cabinets decommissioned); • The data is not compromised by roadside maintenance. By contrast a small percentage of data from roadside devices is compromised by maintenance actions – such errors are not easy to detect, and can persist for a while before detection; • The data is based on individual vehicles. The full speed distribution is available as is the origin/destination track of vehicles (truncated – start and end removed for privacy reasons). This makes this data of great value for detailed analysis. As the type of vehicle is also known, speed limited vehicles can be excluded to avoid measuring the effect of speed limiters; • The data is nationally available, allowing for comparisons with local roads to be developed; • Practically speaking, Highways England analysts have found this data source to give consistent and stable results with few artefacts. <u>Data quality considerations for the flow data:</u> • Flow data are taken from counting devices, such as loops in the road; • Flow on each road link is usually measured based on a single device located along the link; • Flow data on individual links can be compromised if measurement devices fail (eg flows in one lane

Field	Notes
	may no longer be recorded if the relevant loop fails) or if measurement devices are not correctly assigned to the link. By using expected flow (rather than observed flow) in each 15-minute period, flow weighting can be done and is more robust with respect to data gaps caused by incidents or flow measurement device issues. Given the information above and in the validation/cleansing field, a Data Quality Score of 2A is given The representativeness of the data is classed as 2: the flow data is deemed as representative, although devices may fail and miss vehicles. The Traffic Master GPS data covers all but a few exceptional links, although as noted above, the sample may be biased. The accuracy of the data is classed as 1: flow data is deemed very accurate at a national level, and the Traffic Master GPS data only has some issues for links that are very short or that run very close to other roads and also some infilling of data. As such, the validity score is 2. The reliability of the data is classed as A, as the process is fully automated.

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of assessment	Journey times of vehicle types other than cars. (It is assumed that the trends measured for cars will also reflect the road user experience for other vehicle types).

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director

Field	Notes
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels may result in more congestion which will reduce speeds.	Exact linkage is currently undefined.	No management is in place at this stage.

Encouraging Economic Growth

KPI: Average delay (time lost per vehicle per mile)

Narrative: Many of the effects of a well-functioning transport network are indirect and can be difficult to measure. As such, average delay will be measured to provide an indication of the drag on the economy that poor performance on the Strategic Road Network (SRN) brings. Given that there are many factors that influence average delay, including the performance of the economy as a whole, some of which are not within Highways England's control, Government did not set a target for this measure in the first Roads Period, but Highways England should act in a way that will minimise delay as far as possible.

Definition: This measure is the delay experienced by individual vehicles expressed in seconds per vehicle per mile. It is based on the difference between the actual journey time and free-flow journey time. It will be calculated monthly and presented on a rolling year basis. This measure presents individual vehicle delays on both large and small roads equally.

[Free flow journey time is calculated using the speed limit on the link in question. Weighting by expected flow is carried out to allow values to be aggregated up from a link basis. Use of the expected flow rather than the actual measured flow ensures that delay is not under-recorded in incidents].

KEY DEFINITIONS

NTIS - National Traffic Information Service – a service provided by Network Information Services. There is a NTIS based network – a data warehouse containing traffic data.

MIDAS - Motorway Incident Detection and Automatic Signalling – system for detecting queuing traffic and alerting drivers approaching queueing traffic.

TMU - Traffic Monitoring Unit: Counting loop in the pavement which counts traffic.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	Low delay represents journeys close to free flow speeds, where the effects of congestion and incidents are modest.
Assumptions	In the calculation of the measure this note assumes that: • the measure will be calculated initially from Teletrac Navman GPS data, using journey times from individual vehicle link transit times for cars only. (Other data sources could be used, now or in future); • the free-flow speeds calculated from historical data are appropriate and can still be applied following the transition to the new reference network; • a suitable source of journey time data (such as Teletrac Navman GPS) will be available throughout

Field	Notes
	the first Road Period; • the sample-based journey time data (such as Teletrac Navman GPS) is sufficiently accurate to calculate delays reliably. The average delay measured for cars will also reflect that experienced by other vehicle types. (The measure will be based on data from cars only. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the Teletrac Navman sample and introduce artefacts, in particular vehicle mix changes in the measured fleet would introduce unwanted issues). It should be noted that no compensation for any effect is included in this measure, other than the smoothing effect of weighting by expected flow [to avoid under-representing short term delay from incidents]. There is no assumed level of works, speed limits, availability, incidents, weather or any factor that might affect it that has been built into the measure.
Organisational dependencies	• This will be affected directly by the requirement to deliver increased capital investment and maintenance on the SRN: a higher volume of roadworks will cause additional delays. Reducing delay in works will depend on working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely, and so on as to achieve the availability KPI target. It should be noted that no projection has been made against this measure, and in particular that no prediction for its level given the planned volume of road works and targeted availability metric has been made. • Reductions in delay depend on successful delivery of schemes aimed at improving journey times and reducing congestion and – to some extent – on effective incident management. Schemes with different purposes such as improving safety, supporting environmental or accessibility objectives, or increasing capacity within the existing roadspace by use of technology may increase measured delay depending on the design of the specific schemes. Improved compliance to posted speed limits will also affect measured delay.
Government targets	N/A
External influences	This measure is sensitive to external influences outside the control of Highways England, most importantly to weather and changes in demand. An increase in the number of speed-limited vehicles may also reduce the measure, if this causes slower speeds for cars travelling on the same roads [where roads are carrying traffic loads beyond those they can carry and remain in 'free flow', ie vehicles are interacting and slowing each other down].

Field	Notes
	The measure may be affected by changes in the working practices in the supply chain. Legislative or other restrictions on Highways England limiting flexibility in the delivery of works and traffic management could influence the measure. Requirements to deliver more works than anticipated would cause a deterioration of the measure. Temporary speed limits (eg for air quality improvements) would cause a deterioration of the measure.

RISKS

Field	Notes
To meeting target	The key risks that may cause an increase in delay in comparison to a prior year are: • Weather (in particular extended and widespread periods of rain and snowfall); • Roadworks to deliver an increased investment programme; • Traffic growth causing additional congestion; • Growth in the percentage of speed limited vehicles on the network; • Changes to the road network carried out for reasons other than reducing delay; • Increased application of temporary and variable speed limits.
To reporting	• Continued availability of the GPS data, or a near equivalent to provide journey time data on all strategic roads; • Changes in the types of measurement devices used for flow measurement.

METHODOLOGY

Field	Notes
Unit of measure	Seconds per vehicle per mile
Type of data	Journey times from individual vehicles and flows; flows sourced from the Highways England's own measurement devices and journey times from third parties (currently Teletrac Navman (UK) Ltd (formerly known as)).
Geographical coverage	All roads on the SRN
Baseline period	April 2015 – March 2016
Baseline value	8.93 seconds per vehicle per mile
Historical data	From January 2009, however, comparisons can only directly been made with data from April 2015 onwards.
Methodology and calculation	*Data Collection:* • The raw journey time data consists of individual observations from instrumented vehicles at 10 second intervals. • Flow data are obtained from traffic monitoring unit (TMU) or MIDAS counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link.
	Calculating the metric: • Delay is calculated for each 15 minute period as [the larger of either (Journey Time – Free-flow journey time) or zero] * Expected Flow • Average Delay = sum over all 15 minute periods of (Delay) / sum over all 15 minute periods of ([Expected Flow] * [Length of link]) • Delay is presented per vehicle/mile and calculated as the total delay divided by the total vehicle miles. • Expected Flow is currently calculated as a combination of flows measured in the given 15-minute and similar time periods. Expected rather than observed flow is used to avoid under-recording of delay during incidents or diversions [measured flows are low during incidents, so incident delay would be systematically underestimated if measured rather than expected flows were used]. Time periods without observed data are infilled with the average journey time from 1 or 2 periods either side of the period required. Time periods without data after this process are infilled with the monthly average value of this metric for the link by day and night, ie for link ABC123 in December 2016 any night time periods

Field	Notes
	without data would be infilled with the monthly night time average value for link ABC123 calculated for the whole of December 2016. Infilling with the average in this way ensures that periods with missing data have a generally neutral effect. If there are links which have a large number of missing periods after this process, these links will be excluded from the calculation. Free-flow journey times are calculated from data for cars only. We are not proposing to update free-flow journey times during the first Road Period, except in exceptional circumstances which may include an upgrade of road class that would cause a link to receive a new reference number in the network definition.
Data collection frequency	Journey time and flow data are collated and processed on a monthly basis. Reporting generally takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data.
Validation/ cleansing	*Data Collection:* Teletrac Navman (UK) Ltd (formerly known as TrafficMaster) GPS data The raw data consists of individual observations from instrumented vehicles at 10 second intervals. In order for any particular vehicle's journey to be accepted, the following conditions must be satisfied: • The start and end of each junction-to-junction section is associated with a virtual 300m square box the vehicle must be observed in the start box and, sometime later, in the end box; • no more than 10% of the expected observations in between must be missing (this percentage is adjusted if there is a tunnel or other known obstruction on the link; • The calculated speed based on the start and end times and link length must be within a specified tolerance of the average spot speeds observed along the link, in order to reject journeys where the vehicle took an alternative route which was not on the SRN. (The actual tolerance used is dependent on the link); • Some specific links are filtered out if they are known to be parallel to another road; • Only observations from cars are used. Using individual vehicle data from all vehicle types would make this measure strongly dependent on the composition of the Teletrac Navman sample and introduce artefacts. Flow data Flow data are obtained from traffic monitoring unit (TMU) or MIDAS counting sites. Each site is associated

Field	Notes
	with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link. Validation is carried out to check that counts are consistent along a journey so that, for example, the sum of slip road and interslip counts is equal to the count on the main carriageway. Flow data is collected through the NTIS which has automated validation routines through which all flow data is passed. The 'expected flow' is used rather than the actual measured flow to avoid under-representing the impact of incidents.
	Calculating the metric: The metric is calculated using a series of automated calculations.
Data quality score	Data quality considerations for the TrafficMaster GPS data • Teletrac Navman (formerly TrafficMaster) GPS: data source for the on time reliability measure (National Statistic); • Data is from a sample of vehicles only. Sample sizes can be very small for peripheral parts of the network or at quiet times of the day; • The sample is not randomly selected and may be biased. In particular it tends to reflect the journeys of business drivers. Care needs to be taken with the vehicle type composition of the sample changing over time, which is why the measure will use just car data; • Raw data from individual vehicles is collected by a third party (Teletrac Navman). • Data is processed to calculate link transit times; • There are some known difficulties in calculating accurate link transit times from GPS data for links that are very short or that run very close to other roads; • The restriction to cars-only data from the Teletrac Navman dataset relies on correct vehicle classification; • As the data is independent of that produced by in-road devices it gives good quality data during roadworks, where other in-road or roadside devices are often compromised (eg traffic is moved on to a contraflow, and so is not where fixed measurement devices expect it to be) or removed by the works (typically loops are planed out or roadside cabinets decommissioned); • The data is not compromised by roadside maintenance. By contrast a small percentage of data from

Field	Notes
	roadside devices is compromised by maintenance actions – such errors are not easy to detect, and can persist before detection; • The data is based on individual vehicles, the full speed distribution is available as is the origin/destination track of vehicles (truncated – start and end removed for privacy reasons). This makes this data of great value for detailed analysis; • The data is nationally available, allowing for comparisons with local roads to be developed; • Practically speaking, Highways England analysts have found this data source to give consistent and stable results with few artefacts. Data quality considerations for the flow data: • Flow data is taken from counting devices, such as loops in the road; • Flows on each road link or section are measured from devices located along the road link or section, where available. Where no device is available on the road link or section, an expected flow value is infilled from devices on adjacent road links, and if this is also unavailable then the flow is infilled from an expected flow calculated nationally from road links of the same road type for the same time day type and time period of day. This ensures every road link has a flow value with which to weight the journey time observed, which enables aggregation of the metric.. • Flow data on individual links can be compromised if measurement devices fail (eg flows in one lane may no longer be recorded if the relevant loop fails) or if measurement devices are not correctly assigned to the link; • By using expected flow (rather than observed flow) in each 15-minute period, under-recording of delay during incidents is avoided. Given the information above and in the validation/cleansing field, a Data Quality Score of 2A is given The representativeness of the data is classed as 2: the flow data is deemed as representative, although devices may fail and miss vehicles. The Teletrac Navman GPS data covers all but a few exceptional links, although as noted above, the sample may be biased. The accuracy of the data is classed as 1: flow data is deemed very accurate at a national level, and the Teletrac Navman GPS data only has some issues for links that are very short or that run very close to other roads and also some infilling of data. As such, the validity score is 2. The reliability of the data is classed as A, as the process is fully automated.

REPORTING

Field	Notes
Highways England reporting	Monthly (calculated monthly and presented on a monthly and rolling year basis. Monthly data is known to be quite seasonal.)
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels will result in increased delay, if larger than the increase in capacity over the same period.	Exact linkage is currently undefined.	No management is in place at this stage.
Availability KPI	Decreases in availability will correspond with an increase in delay, because of the implied increase in works with speed limits.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Percentage of formal planning applications responded to within 21 days of receipt by Highways England

Narrative: Show how Highways England is playing its role in the planning system as it will be inheriting the Highways Agency's status as a major statutory consultee in the planning process;
Definition: Percentage of formal responses from Highways England, to Local Planning Authority issued planning application consultations, within 21 days of their receipt.

KEY DEFINITIONS

The Town and Country Planning (Development Management Procedure) Order 2010 (the 'DMPO') specifies that the Secretary of State for Transport must be consulted on all planning applications that either would have a material change to the traffic entering or leaving the Strategic Road Network (SRN) (Article 16 of DMPO), or alters an access or is within 67m of the centreline of the SRN (Article 26 of the DMPO). Such a consultation, issued by the Local Planning Authority (LPA) is referred to as a 'formal planning application'. Highways England will at times be consulted on applications before they are formally consulted on a scoping basis – known as a 'pre application consultation'.
The formal statutory deadline for a DMPO Article 26 case (i.e. direct access to the SRN) is 28 days. However, Highways England has agreed the same working deadline as the statutory deadline for an Article 16 case; i.e. 21 days. The consultee (Highways England) is required to issue a substantive response by the statutory deadline. This is referred to as a 'formal response'.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	99% of formal planning applications should be responded to within 21 days
Measure of success	Meeting the target value
Assumptions	None
Organisational dependencies	Achieving target relies on prompt advice from consultants/contractor (consultants/contractors are utilised in approximately 80% of cases).
Government targets	The target value is a statutory deadline from the Department for Communities and Local Government which Highways England has to meet.
External influences	None identified

RISKS

Field	Notes
To meeting target	Poor employee organisational skills could put meeting the target at risk.
To reporting	• Relies on correct dates being manually entered, but use of the database is well established as is the 21 day target. What few failures there are to meet the 21 day target are sometimes administrative and a reply has actually been sent within time e.g. date entered in wrong field, or date of reply not entered promptly and not captured in end of month draw down of data. If this is picked up during data cleansing, then the error is rectified. Automatically generated reminders from the database reduce the risk of missed deadlines. • There is a risk that teams could be driven to issue holding recommendations in the 21 day timeframe that would count as a reply, to give more time to assess applications – but such recommendations have to be justified within a statutory framework (generally around lack of information from the applicant); and the proportions of holding direction responses issued previously by Highways England are low (around 10% in 2014/2015). • There is also a risk that applications will not be properly considered in terms of their impact on the SRN given the looming deadlines, but there are processes in place to ensure team leader sign off when planning consultancy advice is not being followed. • The Development Control Database is expected to be upgraded by Autumn 2015, although no impact on reporting is expected. The database should be more intuitive to use and assist in driving out any administrative errors egg • use of responses generated from within the system to ensure no errors in input of response dates.

METHODOLOGY

Field	Notes
Unit of measure	Percentage, monthly, one month in arrears.
Type of data	Management data from Development Control Database – stemming from manually inputted date of receipt of planning application consultation, and manually inputted date of reply, which is compared to an automatically generated target date 21 days from the manually entered date of receipt. The production of a report monthly to analyse data shows up any errors or omissions, and provides a quality check. The report is done by exporting data from the database to Excel, allowing for analysis by week/month/year (or any specified time period), case worker, region, at national level, by Local Authority, or indeed by any other

Field	Notes
	parameter that the database captures. This allows for identification in trends by type, time, and nature of response and allows areas of concern to be addressed and focussed interventions to improve performance generally.
Geographical coverage	England
Baseline period	2012/13
Baseline value	99.6%
Historical data	Annual (and monthly) figures are available from March 2010
Methodology and calculation	*Data collection:* Data is extracted on the first working day of the month (ie the first working weekday of the month), from the Development Control Database, using tools to extract data onto an Excel spreadsheet
	Calculating the metric: The percentage of planning application responses within 21 days, collated both monthly, and (financial) year to date. ([Responses due made within 21 days in Period]/ [Responses Due total in Period]) x100%. Eg If a planning application was received on 1 January 2015 it will be due a response by the 22 January 2015. This measure identifies the percentage of applications that achieve this 21 day target, within the time period stipulated (usually monthly or annual figure).
Data collection frequency	Monthly
Validation/ cleansing	*Data collection:* What few failures there are to meeting the 21 day target are sometimes administrative and a reply has actually been sent within time eg date entered in wrong field, or date of reply not entered promptly and not captured in end of month draw down of data.
	Calculating the metric: Regular checks are carried out by the National Planning Team when producing the monthly National Planning Report, and if an error is picked up during data cleansing, then it is rectified. The monthly report is also run past the Operations directorate (OD) Regional Director lead for Planning, then all OD Directors and the OD Board Director, before release outside of Highways England.
Data quality score	1A Validity is 1, as the data is derived nationally, covering the whole of the SRN (Representativeness > 90%), and accuracy is generally 100%, and has never fallen below 90%. Reliability defined as 'A' as process is sound, partially automated, and management are very satisfied with it. Errors in calculation are minimal, and appropriate checks are carried out once the PI is calculated.

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Operations Director
Delivery Manager	Operations Directorate, National Planning Team

KEY INTERDEPENDENCIES

The full list of KPI/PI has been reviewed. There are considered to be no key interdependencies which are likely to have a direct or significant impact on the performance of this indicator.

PI: Average delay (time lost per vehicle per mile) on Gateway Routes

Narrative: Help represent and support business users. These can include looking at individual driver delay on gateway routes to represent service experience for importers/exporters and international travellers.
Definition: This measure is the delay experienced by individual vehicles on gateway routes expressed in seconds per vehicle per mile. It is based on the difference between the actual journey time and free-flow journey time. It will be calculated monthly and presented on a rolling year basis.

KEY DEFINITIONS

Free flow journey time is calculated using the speed limit for cars on the link in question. Weighting by expected flow is carried out to allow values to be aggregated up from a link basis. Use of the expected flow rather than the actual measured flow ensures that delay is not under-recorded in incidents.
Gateway routes are defined as the core trans-European transport network TEN-T network in England, as at the start of the Road Period.
NTIS - National Traffic Information Service – a service provided by Network Information Services. There is a NTIS based network – a data warehouse containing traffic data.
MIDAS - Motorway Incident Detection and Automatic Signalling – system for detecting queuing traffic and alerting drivers approaching queueing traffic.
TMU - Traffic Monitoring Unit: Counting loop in the pavement which counts traffic.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	No target
Measure of success	Low delay represents journeys close to free flow speeds, where the effects of congestion and incidents are modest.
Assumptions	• See the note for the Average Delay KPI. • For calculation purposes this note assumes that gateway routes will be defined as the roads that are both on the Strategic Road Network (SRN) and on the core TEN-T at the start of the Road Period.
Organisational dependencies	(Only schemes on the TEN-T network will affect this measure). This will be affected directly by the requirement to deliver increased capital investment and maintenance on the SRN: a higher volume of roadworks will cause additional delays. Reducing delay in works will depend on

Field	Notes
	working practices in the organisational units delivering maintenance and capital investment projects and in the supply chain. There will be competing priorities, such as delivering works on time, cost effectively, safely, and so as to achieve the Availability KPI target. Reductions in delay depend on successful delivery of schemes aimed at improving journey times and reducing congestion and – to some extent – on effective incident management. Schemes with different purposes such as improving safety, supporting environmental or accessibility objectives, or increasing capacity within the existing roadspace by use of technology may increase measured delay depending on the design of the specific schemes. Improved compliance to posted speed limits will also affect measured delay.
Government targets	N/A
External influences	This measure is sensitive to external influences outside the control of Highways England, most importantly weather and changes in demand. An increase in the number of speed-limited vehicles may also reduce the measure, if this causes slower speeds for cars travelling on the same roads. The measure may be affected by changes in the working practices in the supply chain. Legislative or other restrictions on Highways England limiting flexibility in the delivery of works and traffic management could influence the measure. Requirements to deliver more works than anticipated would cause a deterioration of the measure. Temporary speed limits (eg for air quality improvements) would cause a deterioration of the measure.

RISKS

Field	Notes
To meeting target	(Only schemes on the TEN-T network will affect this measure.) The key risks that may cause an increase in delay are: • Weather (in particular extended and widespread periods of rain and snowfall); • Roadworks to deliver an increased investment programme; • Traffic growth causing additional congestion; • Growth in the percentage of speed limited vehicles on the network; • Changes to the road network carried out for reasons other than reducing delay; Increased application of temporary and variable speed limits. Eg Increased implementation of Smart Motorways.

Field	Notes
To reporting	• Continued availability of the TrafficMaster GPS data, or a near equivalent to provide journey time data on all strategic roads. • Changes in the types of flow measurement devices used.

METHODOLOGY

Field	Notes
Unit of measure	Seconds per vehicle per mile
Type of data	Journey times from individual vehicles and flows; sourced from Highways England's own flow measurement devices and journey times from third parties (currently Teletrac Navman (UK) Ltd (formerly known as TrafficMaster)).
Geographical coverage	Gateway routes only, eg the core TEN-T
Baseline period	April 2015 – March 2016
Baseline value	8.09 seconds per vehicle per mile
Historical data	From Jan 2009
Methodology and calculation	*Data collection:* • The raw journey time data consists of individual observations from instrumented vehicles at 10 second intervals. • Flow data are obtained from traffic monitoring unit (TMU) or MIDAS counting sites. Each site is associated with a road link and sites might be combined to obtain an average or sum of multiple sites associated with a link.
	Calculating the metric: See average delay KPI technical note (applied to gateway routes only).
Data collection frequency	Journey time and flow data are collated and processed on a monthly basis. Reporting generally takes place no sooner than around 5-6 weeks after the end of the reporting period to allow for the collation and processing of the data.
Validation/ cleansing	*Data Collection:* See average delay KPI technical note (applied to gateway routes only).
	Calculating the metric: See average delay KPI technical note (applied to gateway routes only).

Field	Notes
Data quality score	See average delay KPI technical note (applied to gateway routes only).

REPORTING

Field	Notes
Highways England reporting	Monthly (All time periods, calculated monthly and presented on a monthly and rolling year basis. Monthly data is known to be quite seasonal).
Outside scope of assessment	Delay on roads that are not part of the gateway routes.

APPROVAL PROCESS

Field	Notes
Accountable Director	Strategy and Planning Director
Delivery Manager	Performance Analysis Unit Team Leader

KEY INTERDEPEDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels will result in increased delay, if larger than the increase in capacity over the same period.	Exact linkage is currently undefined.	No management is in place at this stage.
Availability KPI	Decreases in availability will correspond with an increase in delay, because of the implied increase in works with speed limits.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Meet the Government target of 25% Small and Medium sized Enterprise (SME) direct and indirect spend

Narrative: Demonstrate that Highways England is supporting meeting the (expected) government target of 25% of direct and indirect spend to small and medium sized enterprises.
Definition: This measure is designed to indicate the proportion of Highways England spend with SMEs.

KEY DEFINITIONS
PROJECT BANK ACCOUNTS (PBAs) - A ring fenced bank account owned by the tier 1 contractor designed to ensure simultaneous prompt payment across the supply chain.
MONTHLY MANAGEMENT ACCOUNTS (MMAs) - Financial reports from Highways England accounts system showing in-year financial performance.
BRAVO - web based collaborative procurement tool.
TIER 1 SUPPLIER - Contracted directly by Highways England.
TIER 2 AND 3 SUPPLIER - Sub-contracted supplier.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Meeting the government target
Assumptions	The spend covers all direct and indirect procurement spend ie it includes SME spend through the supply chain down to Tiers 2 or 3. Highways England contracts with a Tier 1 contractor, whilst Tier 2 and 3 suppliers are subcontracted via the Tier 1. Indirect SME spend is identified through PBA and spend identified will only be for those suppliers who have joined the PBA. Therefore the calculation will be based upon only the known proportion of expenditure in PBAs which relates to SMEs. PBAs are employed in the majority of new major schemes and maintenance contracts. They cover major schemes that are in construction, so any suppliers Highways England contracts with prior to this phase are not used when calculating the proportion of expenditure with SMEs spend. It is important to note that the PBAs were originally set up to ensure 2nd and 3rd tier suppliers are paid promptly; determining SME's expenditure' from PBAs is a bi-product.

Field	Notes
	As a rough guide a 80/20 rule is used when assessing whether to use data from a specific PBA in the calculation. If 80% of all sub-contractors (ie Tier 2 / 3) by value are signed up to the PBA then the amount spent through the PBA is used in the SME spend calculation. If the value is significantly under 80%, then it is considered that insufficient data exists to contribute to the SME calculation. In practice this only tends to be an issue in the early stage of a contract.
Organisational dependencies	Performance on this metric is dependent on the approach to spend through frameworks (eg Collaborative Delivery Framework), and OD and Major Projects directorate (MP) spending decisions.
Government targets	This target relates directly to a government target of 25% direct and indirect procurement spend with SMEs.
External influences	N/A

RISKS

Field	Notes
To meeting target	There is a risk that with the increased amount of capital spend and the increased focus on efficiency savings, Highways England may use a different operating model, which could change the level of spend with SMEs. As some of the Agency's current SME spend is through Tier 1 contractors, the amount of spend is partly dependent on to what extent Tier 1 suppliers continue to utilise SMEs.
To reporting	The process of collecting and reporting this data is still improving. The process is coordinated by Finance and Business Services Directorate (FSB) using information from PBAs. The value of contracts operating a PBA is increasing and as more data becomes available this will lead to a more accurate assessment of total SME spend.

METHODOLOGY

Field	Notes
Unit of measure	Percentage
Type of data	There are three types of data used in calculating this indicator • Monthly Management Accounts (MMAs) provide total spend figures, which is compared with • Direct SME spend (DfT Bravo reports) which is added to • Indirect SME spend (calculated from data available from PBA reports)

Field	Notes
Geographical coverage	Indirect SME spend across major projects and maintenance contracts is captured through PBAs and the average %spend is applied to relevant expenditure categories.
Baseline period	2013
Baseline value	Q1 2013 = 28.9% Q2 2013 = 28.9% Q3 2013 = 31.9% Q4 2013 = 33.1%
Historical data	Assessment of SME spend data exists from April 2013, with calculations being undertaken quarterly: Q1 2013 = 28.9% Q2 2013 = 28.9% Q3 2013 = 31.9% Q4 2013 = 33.1% Q1 2014 = 28.4%
Methodology and calculation	*Data collection:* The MMAs are populated based upon data contained within the Oracle finance system. Bravo is populated by DfT. PBAs are bank accounts owned by the contractor. Highways England requests each Tier 1 contractor to complete a template which is used to calculate SME spend.
	Calculating the metric: Total direct SME spend is taken from DfT Bravo reports which obtains data direct from Highways England's Oracle System. Indirect SME spend is based on assumptions on PBA SME spend. Actual spend to SMEs through PBAs is provided to Finance & Business Services by the Cost Intelligence Team in Commercial Division (from PBA data) The total PBA SME spend is applied against total PBA spend to calculate an average SME % . This % is then applied to other indirect non PBA spend using spend figures contained in the Monthly Management Accounts (MMAs). The direct and indirect spend totals are then added together. The total SME % is taken from the total estimated SME spend against the total MMA spend (less payroll, accommodation and ICT).
Data collection frequency	Data is analysed quarterly.

Field	Notes
Validation/ cleansing	*Data collection:* • MMAs: these reflect the expenditure of Highways England, which in turn is reported in the annual report and accounts which are audited are audited by the NAO annually. Additional checks are performed from time-to-time by internal audit. • PBAs: spot checks are carried out on approximately 10% of PBAs, further checks are made if errors are found
	Calculating the metric: • The final metric is sense checked by comparing to previous quarter's performance.
Data quality score	Data Quality Score: 2C The representativeness of the data is classed as 2. This score has been giving considering the three data sources used to calculate this metric: • MMAs: – These are compiled by the Financial Accounting team and the data is completely representative. • Bravo: The representativeness of the Bravo database is considered to be good. • PBA: Not all SMEs sign up to PBAs so not all data are collected and the internal system for recording SME spend is still improving. However, in terms of contract value, we believe that around 85% – 90% of the Tier 2 and 3s will sign up to PBAs. The accuracy of the data is classed as 2. This score has been giving considering the three data sources used to calculate this metric: • MMAs: – These are compiled by the Financial Accounting team and the data is very accurate. It is audited by the National Audit Office (NAO) annually (as part of the annual report and accounts), and additional checks are performed from time-to-time • Bravo: There are occasional differences with Oracle records, mainly due to VAT and period paid (timing differences), but generally considered accurate. • PBAs: Deriving SME spend from PBAs is fairly accurate. Spot checks are carried out on approximately 10% of bank accounts, further checks are made if errors are found. As such, the validity score is 2

Field	Notes
	The reliability of the data is classed as C, as the process to transform the raw data into the PI is done manually. The final metric is sense checked by comparing to previous quarter's performance.

REPORTING

Field	Notes
Highways England reporting	Quarterly
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Commercial and Procurement Director
Delivery Manager	Head of Supply Chain Management

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan KPI	Completing the Investment Plan successfully is linked to the SME spend achieved.	Exact linkage is currently undefined.	No management is in place at this stage.

Delivering Better Environmental Outcomes

KPI: Number of Noise Important Areas mitigated

Narrative: Government knows that noise is one of the biggest areas of complaint by communities, and exposure to elevated noise levels can adversely impact on people living and working near the Strategic Road Network (SRN). It is also an area that is partly under the control of Highways England to address, for example, through assets such as low noise road surfaces and barriers. Investigating and mitigating at least 1,150 of around 2,500 Noise Important Areas for which Highways England is the 'Noise Making Authority', as identified through the Department for Environment, Food and Rural Affairs (Defra) Noise Action Plan, is a target set by Government. This will help deliver a better quality of life to around 250,000 people as noise exposure is reduced.

Definition: The areas containing residents exposed to the highest noise levels have been designated by Defra as 'Important Areas' (IA) as part of the Noise Action Planning process. An "Important Area" with respect to noise from major roads will be where the 1% of the population that are affected by the highest noise levels from major roads are located according to the results of the strategic noise mapping exercise [see Noise Action Plan: Roads (Including Major Roads). Environmental Noise (England) Regulations 2006, as amended January 2014]. Highways England is the 'Noise Making Authority" for IAs where noise from the SRN contributes to the noise level. If the SRN and local roads contribute to noise within the IA, there will be more than one 'Noise Making Authority' for that IA.

The metric will measure the number of Important Areas (IAs) where interventions are used to reduce the noise exposure of the population within the IA. IAs within major scheme areas will, if practical, be mitigated by or as part of the major scheme. Operations will mitigate IAs through resurfacing and barriers funded through the Environment Designated Fund. The majority of NIAs will be mitigated through the noise insulation scheme, managed by SES and funded through the Environment Designated Fund. The noise insulation scheme targets IAs with less than 10 properties, to achieve value for money that is not possible through resurfacing or barriers. This has been consulted on, and has support from external stakeholder groups.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	1150 Important Areas (IAs) where interventions are used to reduce the noise exposure of the population within the IA.
Measure of success	Meeting (or exceeding) the target to reduce the noise levels, through interventions, of 1,150 Important Areas (IAs).
Assumptions	• IAs within major scheme areas will, if practical, be mitigated by or as part of the major scheme. Operations will mitigate IAs through resurfacing and barriers funded through the Environment Designated Fund. The majority of NIAs will be mitigated through the noise insulation scheme, managed by SES and funded through the Environment Designated Fund

Field	Notes
	• Value management processes will be modified to ensure that the resurfacing programme prioritises stretches of road adjacent to IAs. • The NIA is recorded as mitigated when the first mitigation measure is installed in RIS1. • Highways England's understanding of 'mitigated' has developed through experience of delivery and as a consequence of discussions with the Highways England Noise Stakeholder Group. For KPI purposes NIAs will be counted as mitigated when a first mitigation measure is installed and used for all delivery against the KPI from the start of Roads Period 1 onwards. The use of this definition from the start of Roads Period 1 is appropriate as there is a single KPI target for noise mitigation to be met at the end of the roads period.
Organisational dependencies	Operations directorates (OD) and Major Projects (MP) will be required to deliver the interventions on the network.
Government targets	The Noise Making Authority (in this case Highways England) is obliged to investigate IAs by government, but is not required to mitigate IAs.
External influences	Government noise policy requires new developments to 'improve' the noise environment, 'where possible', in the context of government policy on sustainable development.

RISKS

Field	Notes
To meeting target	Meeting the target is dependent on the success of the noise insulation scheme. Opportunities to contribute to the KPI may be missed if resurfacing schemes in the vicinity of noise important areas to are not extended to complete all of the resurfacing required for mitigation, either in the Renewals programme or Major Projects.
To reporting	Reporting of mitigation through resurfacing relies on data being inputted into HAPMS. If this does not occur, there is a risk that performance will be under reported.

METHODOLOGY

Field	Notes
Unit of measure	Noise Important Area

Field	Notes
Type of data	NIAs are geographic areas. Data stored as shapefiles and available on ENVIS
Geographical coverage	Entire SRN
Baseline period	N/A
Baseline value	Zero
Historical data	N/A
Methodology and calculation	*Data Collection:* Count of IAs mitigation measures will be physical, so will be installed under a contract.
	Calculating the metric: Normal quality assurance procedures will ensure they have been delivered.
Data collection frequency	Annual reporting with quarterly updates.
Validation/ cleansing	Mitigation measures will be physical, so will be installed under a contract. Normal quality assurance procedures will ensure they have been delivered.
Data quality score	1C **Validity** Accuracy = this is a measure that has to be measured physically, therefore there is no error in determining it, and has been scored as 1. e.g. if a noise barrier is there or not. Representative = all the actual locations over the whole network are counted, and is therefore scored as 1. **Reliability** Reliability = has been scored as C, as someone will need to check manually if a noise measure has been installed or not. This cannot be automated and therefore the scores of A and B are irrelevant.

REPORTING

Field	Notes
Highways England reporting	Reported in Corporate Dashboard

Field	Notes
Outside scope of assessment	The population experiencing reduction in noise levels can be estimated, but is not linked to this indicator.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering & Standards Director
Delivery Manager	Principal Noise Advisor

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Pavement KPI	If we end up resurfacing a smaller proportion of network, the number of IAs we address will go down.	Exact linkage is currently undefined.	No management is in place at this stage.
Delivery Plan Progress KPI	If progress of work relative to forecasts (scheme delivery) goes up then the noise important areas may decrease.	Exact linkage is currently undefined.	No management is in place at this stage.

KPI: Delivery of improved biodiversity, as set out in Highways England's Biodiversity Action Plan

Narrative: Biodiversity is intrinsically valuable. For example, it contributes to our economic and social wellbeing through food, fresh water, and clean air. Biodiversity also contributes to less obvious services such as protection from natural disasters, regulation of our climate, and pollination of our crops. We have an aspiration that the operation, maintenance, and enhancement of the Strategic Road Network (SRN) should move to a position that delivers no net loss of biodiversity. And, in the long term, Highways England should deliver a net gain across its broader range of works. By 30 June 2015, Highways England will publish a Biodiversity Action Plan to show how we will work with service providers to halt overall biodiversity loss, and maintain and enhance habitats and ecological networks. We will demonstrate progress against the Biodiversity Action Plan, to secure an ongoing annual reduction in the loss of net biodiversity due to its activities, with the aim that activity in the second Roads Period delivers no net loss of biodiversity.

Definition: The Biodiversity Action Plan (BAP) will be published by 30 June 2015, and we will subsequently report annually against the delivery of this Plan.

A metric will be developed to capture Highways England's performance in integrating the conservation of biodiversity (ie the restoration or enhancement of populations of living organisms or habitats) in all of our activities and specifically contributing to halting biodiversity loss.

Subsequently, a baseline for this metric will be collected, against which any reduction in net biodiversity loss can be reported annually.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	• Reduction in the net loss of biodiversity by end of the first Road Period, on an ongoing annual basis.
Measure of success	• Publication of a Biodiversity Action Plan (BAP) by 30 June 2015. • Reporting annually on how Highways England has delivered against the Plan (the key deliverables from the BAP will be populated here once the BAP is published). • Introduction of a new or improved biodiversity metric (this is a Requirement in the Performance Specification, but is noted here for context).
Assumptions	• To demonstrate a reduction of loss of biodiversity, the development of a metric is needed (short term – timescales to be confirmed in BAP). • Similarly, a baseline for the metric will then need to be established (short-medium term - timescales to

Field	Notes
	be confirmed in BAP). • Subsequently, support from the business for collecting metric data through projects will be needed • Measure of performance and change in biodiversity against baseline should be based on Highways England exercising its functions (ie Highways England's activities), specifically excluding change associated with external events outside of Highways England's control eg extreme weather events or accidents.
Organisational dependencies	Reliance on Major Projects directorate (MP) and Operations directorate (OD) programmes, and operations identifying opportunities to delivering against the new metric, adopting the metric and reporting against it. Reliance on completing programme of schemes, and Environment Fund as set out in the RIS.
Government targets	Government have aspired to: • The conservation of biodiversity (Natural Environment and Rural Communities Act 2006, Regulation 40. Duty to Conserve Biodiversity). • Reduce net biodiversity loss. • Contribute to biodiversity gain • Support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.
External influences	Change associated with external events outside of our control eg extreme weather events or accidents.

RISKS

Field	Notes
To meeting target	• There is a risk that up to this point, the level of consideration and weighting given to biodiversity enhancement in decision making for schemes has been influenced by the need for "regard" to be given to conserving biodiversity, as far as is consistent with the proper exercise of our functions. As such while decisions have been based on a balance of those functions it is likely that schemes in development up to April 2015 (in particular those schemes already committed to delivery early in the first Road Period) have not been optimised to enhance biodiversity outcomes. Therefore, the impact of these schemes on the new or improved biodiversity measure, although uncertain, is unlikely to be positive. For future schemes that are to be developed, we will give greater weight to biodiversity enhancement in decision making.

Field	Notes
	• Schemes/area teams do not identify opportunities for sustainable biodiversity enhancement. We will confirm how we will mitigate this risk. • There is a reliance on capital investment through the ring-fenced funds to deliver all enhancements. We will mitigate this risk through the identification of a forward programme of interventions, to be allocated regionally. • Biodiversity enhancements do not become integrated into mainstream operation and improvement activities. We will confirm how we will mitigate this risk.
To reporting	Risks, to be addressed in the BAP, are: • There is a need to establish a methodology and a metric for reporting biodiversity changes. • There is a need to establish a baseline for biodiversity on the SRN. • There is a need to establish a process for collecting annual data on changes (through exercising our functions) against the established baseline.

METHODOLOGY

Field	Notes
Unit of measure	To be developed
Type of data	To be confirmed through publication of the BAP. Examples of data might include: • EnvIS (Environmental Information System – a Highways England system) records supplemented by Phase 1 habitat survey work, desk study records or field work as necessary; • Distribution of species and of Principal Importance for conservation of biodiversity - Priority species and habitats distribution; and • Indicators in accordance with Defra 2014 Biodiversity 2020: a strategy for England's wildlife and ecosystem services.
Geographical coverage	To be confirmed through publication of the BAP
Baseline period	To be confirmed through publication of BAP, given the absence of existing baseline information, this will require collection of information in 2015-16.
Baseline value	To be developed

Field	Notes
Historical data	Site of Special Scientific Interest (SSSI) baseline already established – baseline report of 2015 in process of being finalised. Baseline biodiversity status of SRN to be established.
Methodology and calculation	To be confirmed through publication of BAP. Examples might include: • Assessment of overall biodiversity in reporting year (overall area and value of relevant indicators) • Baseline overall biodiversity (overall area and value of relevant indicators) = change (positive, negative or neutral).
Data collection frequency	At least annually
Validation/ cleansing	To be confirmed through publication of BAP. Examples might include: Review of project environmental assessment reports to allow validation of project measurement of biodiversity change, for consistency and compliance.
Data quality score	To be confirmed

REPORTING

Field	Notes
Highways England reporting	Annual report, progress monitoring at least quarterly.
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Environment Policy Advisor

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan Progress KPI	Delivery of schemes directly has a positive or negative impact on biodiversity.	Exact linkage is currently undefined - varies scheme by scheme	To be confirmed in the BAP
Water Quality PI	Addressing high risk water outfalls may impact the biodiversity metric (depending on the content of the metric).	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Number of Air Quality Pilot Studies completed

Narrative: Air quality is a major issue, with emissions from vehicles such as oxides of nitrogen, and particulate matter, having potentially harmful effects on human health and the environment. We will work with our partners to make progress on reducing the negative impacts on air quality to support wider government initiatives targeted at improving air quality.
Definition: Number of air quality pilot studies completed. The purpose of the pilot studies are to test the feasibility of the 'Air Quality Intervention Measures' for effectiveness and deliverability in the pilot study area and where effective to assess their potential application elsewhere.

KEY DEFINITIONS

A scope of works is currently being developed for the pilot studies. The purpose of the studies is to help understand the current air quality problems in terms of spatial extent of air quality exceedances and the range of concentrations in a given area. This is supported by work to understand the reasons for the problem e.g. detailed traffic numbers and fleet compositions. A pilot study may be targeted at specific interventions and not all studies will be identical. The anticipated outcomes will guide potential targeted mitigation solutions.
We anticipate each pilot study to last for around 12 months, although it is not possible at this time to define how long data gathering and data analysis may take and will be dependent on a range of factors including the size of study area and the ease of installing relevant monitoring equipment.
We are working with Department for Transport (DfT) and the Department for Environment, Food and Rural Affairs (Defra) at this time to develop an initial list of potential sites for the pilot studies, informed by known existing air quality challenges, and also future scheme locations set out in the RIS. As indicated above the purpose of the studies is to learn the reason for the problem and identify what may be cost effective solutions.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	The completion of pilot studies with possible mitigation methods proposed and an end of study report produced. The studies will include a detailed local baseline study to help guide the development of potential mitigation options.
Assumptions	• It is anticipated that consultants on our frameworks will undertake and deliver the pilot studies. • There is sufficient external resource, e.g. consultancy support, available to undertake and complete the pilot studies

Field	Notes
	• The pilot studies are able to identify the delivery of quantifiable, effective and viable air quality intervention measures at the end of any of the pilot studies. • Possible mitigation proposals may need local and national political will to support delivery of an air quality intervention measure as it is likely to need a large scale change to the traffic fleet on the UK road network. • We are currently looking to undertake ten studies over the next three years. Our current schedule is to start the first three pilot studies in Q1 2015/16, the next three in Q3 2015/16 and the last four in Q1 2016/17. This approach is both one of practicality in managing these projects, as well as providing Highways England the opportunity to take the learning from the early studies to help guide the approach and number of future studies. • Additionally the pilot studies need to be completed so findings can be implemented within the RIS programme over the next five years.
Organisational dependencies	• There may be dependencies on Operations directorate (OD) and Major Projects directorate (MP) when conducting a pilot study in an area they are working in/operating eg we may need use of their cameras, data etc. • Dependency on Commercial and Procurement directorate (C&P): there may be instances where specialist support is required which cannot be procured from a standard framework.
Government targets	• The pollution thresholds (primarily NO2) as set out in the EU Directive on Ambient Air Quality (2008/50/EC). • The pollution thresholds (NO2) as set out in the Air Quality (England) (Amendment) Regulations (2002) and supporting Air Quality Strategy targeted at improving areas of poor air quality.
External influences	• Possible update to the EU Directive on ambient air quality with either lower thresholds and / or introduction of new pollutants. • Development of Air Quality Action Plans (AQAPs) in 2015 by Defra to meet their reporting requirements to the EU. • Other Government Departments including Defra, DfT, DECC, DCLG. • Local authorities.

RISKS

Field	Notes
To meeting target	• Managing the capital fund to support broader air quality activities. • Specialist contractor availability – to be managed through the delivery plans. • Availability and deliverability of effective, viable and quantifiable mitigation measures. Based on our current understanding there are no quick, cheap wins for air quality mitigation which are widely acceptable. We are currently working to identify possible mitigation measures and this will be supported by the work undertaken for the pilot studies. • Any likely effective mitigation measures are likely to be large scale and require support and delivery by a range of stakeholders external to Highways England. Ongoing engagement and targeted interactions needed to manage this risk. • The performance of future Euro 6 / VI fleet and other wider trends in air quality are unknown. This may influence conclusions and recommendations made in the pilot studies. • Lack of formal legislation for the Highways England to deliver and enforce any air quality intervention measure either on the Strategic Road Network (SRN) and / or local road network. There is no clear mandate, against a backdrop of an open network, to implement specific interventions on the SRN eg Low Emissions Zone (LEZ), which may hamper our ability to help improve air quality. Highways England are aware that in principle a Local Authority may declare an LEZ on their road network, but it is unclear as to whether they have any jurisdiction over traffic using the SRN.
To reporting	• Reports being completed by the supply chain on time. • Not able to collect all the required data to support the investigation phase of the pilot studies This will be somewhat dependent on the types of data that we are unable to collect and whether alternative data is available (either using different types of data or national statistics), recognising the limitations of this data and how it may influence the outcome of a pilot study.

METHODOLOGY

Field	Notes
Unit of measure	Completion of pilot studies and report issued
Type of data	Likely sources of data include: • Monitoring data • Local authority air quality reports • Traffic data – Traffic & Accident Database System (TRADS), Journey time database (JTDB), Motorway Incident Detection & Automatic Signalling (MIDAS), Automatic Number Plate Recognition (ANPR) cameras. • Natural England's reported data for designated sites. • Defra's Pollution Climate Mapping (PCM) model outputs. • Emissions monitoring data.
Geographical coverage	Entire SRN – although specific locations to be selected for each of the pilot studies.
Baseline period	N/A
Baseline value	N/A
Historical data	Some of the data sources listed above have historical data and have been used to support scheme assessments. However, not all the data has been collected in the past to support these types of studies.
Methodology and calculation	As a minimum pilot studies should follow advice set out in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 – Air Quality, supporting Interim Advice Notes, Defra's technical air quality guidance. Additional guidance may need to be developed support future pilot studies.
Data collection frequency	Collected to support each pilot study.
Validation/ cleansing	Data will be reviewed and analysed to ensure that it is robust enough to support the Air Quality Analytical Assurance requirements as mandated for all our scheme assessments.
Data quality score	Unknown at this time, although we need to work towards a high data quality assurance to support the successful completion of the pilot studies and meet the requirements set out by the analytical assurance process.

REPORTING

Field	Notes
Highways England reporting	Quarterly
Outside scope of assessment	Areas of the SRN not covered by the pilot studies.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Air quality & user-source carbon emissions focal point

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Network Availability KPI	An increase in traffic would lead to worsening in air quality in areas of poor air quality alongside the SRN.	Successful identification of air quality mitigation may help support increase in traffic, whilst not resulting in breaches of the AQ thresholds.	Cross working within lead departments in Highways England and across other relevant Government departments
Traffic PI	An increase in traffic would lead to worsening in air quality in areas of poor air quality alongside the SRN.	Successful identification of air quality mitigation may help support increase in traffic, whilst not resulting in breaches of the AQ thresholds.	Cross working within lead departments in Highways England and across other relevant Government departments
Average Speed PI	Increases in average speed ie by taking traffic out of congestion, would contribute to improvements to air quality. Congested traffic conditions are associated with increased vehicle emissions.	Developing interventions that help to minimise periods of congestion may in some instances help to mitigate adverse air quality impacts.	Through supporting scheme delivery.
Planning Applications PI	Planned developments either close to the SRN, or leading to increases in traffic on the SRN, can introduce new receptors into areas of poor air quality and / or the new traffic lead to a worsening of existing poor air quality areas.	Ensure that the Highways England considers the AQ impacts of any new proposal and provide the appropriate response where they impact on areas of poor air quality. Help support the development of development lead air quality mitigation measures to minimise the adverse air quality outcomes for the SRN.	Supporting Highways England planning colleagues. Work with DCLG to ensure air quality mitigation is an integral consideration across LA planning decisions.

PI: Carbon dioxide equivalents (or CO_2e) in tonnes associated with Highways England's activities

Narrative: Measuring carbon dioxide, and other greenhouse gas emissions, for Highways England and its supply chain as it operates, maintains and improves the network. Changes in climate and the financial and socioeconomic consequences of this change are increasingly well understood. We will need to demonstrate that we are playing our part in helping reduce carbon dioxide, and other greenhouse gas emissions, in line with current and future government targets.

Definition: The measure will focus on reducing Highways England's carbon footprint covering Scope 1, Scope 2 from offices, control centres, the network and Highways England vehicles and the business travel element of Scope 3 as defined by the Greenhouse Gas Protocol.

This organisational coverage aligns with HM Treasury's current minimum reporting requirements for Departments' and Agencies' annual reports and current Greening Government Commitments (ie emissions relating to suppliers, road users and staff commuting are outside the accounting boundary). Scope 2 aspects also align with reporting requirements under the Carbon Reduction Commitment Energy Efficiency Scheme implemented by the Department for Energy and Climate Change.

Highways England's carbon performance unit of measure will be carbon dioxide equivalent (CO_2e) in tonnes and aligns with Highways England's historical corporate and widescale carbon footprint. The CO_2e unit is derived by applying UK government emission factors to basic units of consumption (examples appear below in 'Methodology').

KEY DEFINITIONS

GREENHOUSE GASES - A greenhouse gas (GHG) is any gas in the atmosphere which absorbs heat, and thereby keeps the planet's atmosphere warmer than it otherwise would be. The main GHGs in the Earth's atmosphere are water vapour, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and ozone. GHGs occur naturally in the Earth's atmosphere, but human activities, such as the burning of fossil fuels, are increasing the levels of GHGs in the atmosphere, causing global warming and climate change.

Different greenhouse gases last in the atmosphere for varying lengths of time, and they also absorb different amounts of heat. The "global warming potential" (or "GWP") of a GHG indicates the amount of warming a gas causes over a given period of time (normally 100 years). GWP is an index, with CO_2 having the index value of 1 and the GWP for all other GHGs is the number of times more warming they cause compared to CO_2.

CARBON DIOXIDE - Carbon dioxide (CO_2) is the most common GHG emitted by human activities, in terms of the quantity released and the total impact on global warming. As a result the term "CO_2" is sometimes used as a shorthand expression for all greenhouse gases. A more accurate way of referring to a number of GHGs collectively is to use the term "carbon dioxide equivalent" or "CO_2e".

CARBON DIOXIDE EQUIVALENT (CO_2e) - "Carbon dioxide equivalent" or "CO_2e" is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. A quantity of GHG can be expressed as CO_2e by multiplying the amount of the GHG by its GWP. Eg if 1kg of methane is emitted, this can be expressed as 25kg of CO_2e (1kg CH_4 * 25 = 25kg CO_2e). "CO_2e" is a useful term: it allows "bundles" of greenhouse gases to be expressed as a single number; and it allows different bundles of GHGs to be easily compared (in terms of their total global warming impact).
"Carbon" is used as shorthand for referring to CO_2, or greenhouse gases/CO_2e in general.
The above concise definitions were adapted from an Ecometrica published paper (http://ecometrica.com/)

GREENHOUSE GAS PROTOCOL AND SCOPE - The Greenhouse Gas (GHG) Protocol, developed by World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), sets the global standard for how to measure, manage, and report greenhouse gas emissions.
The GHG Protocol defines direct and indirect emissions as follows:

- Direct GHG emissions are emissions from sources that are owned or controlled by the reporting entity.
- Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.
- The GHG Protocol further categorizes these direct and indirect emissions into three broad scopes:
- Scope 1: All direct GHG emissions.
- Scope 2: Indirect GHG emissions from consumption of purchased electricity, heat or steam.
- Scope 3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, etc.

Greenhouse Gas Protocol and Scopes definitions from the Greenhouse Gas Protocol (http://www.ghgprotocol.org/)

EMISSION FACTORS - In order to report the greenhouse gas emissions associated with an organisation's activities, users must convert 'activity data' such as energy consumption, distance travelled, litres of fuel used into carbon emissions. A government online tool provides the values that should be used for such conversions; it provides step by step guidance on how to use the factors and allows users to tailor the volume and types of greenhouse gas (GHG) values they use during their reporting process.
Government conversion factors for greenhouse gas reporting are here (http://www.ukconversionfactorscarbonsmart.co.uk/)

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Carbon dioxide equivalent emissions to reduce over time.
Assumptions	Data will be captured in a consistent way for continuous reporting over time. Assumptions relate to each of the five aspects of the carbon measure. Such that: • Office management and building management systems improve efficiency and reduce gas consumption. • Traffic Officer vehicles and their use continues to be more efficient and fuel consumption decreases, ring-fenced funds can assist. • Network energy consumption is the dominant component. More efficient lighting and signals are assumed to be used over time, reducing electricity consumption, ring-fenced funds can assist. • Improvements in office lighting and IT equipment are assumed to be used over time reducing electricity consumption. • Business travel is assumed to not significantly increase and carbon intensity of travel is assumed to reduce over time.
Organisational dependencies	Sources of Highways England's corporate emissions (not the supply chain or customer vehicles which are the subject of separate measures) relate to the following organisational areas: • Office gas consumption (Scope 1); • Traffic Officer fuel consumption (Scope 1); • Network electricity (Scope 2); • Office electricity consumption (Scope 2); • Business travel (Scope 3 business travel) with more detailed analysis by mode available.
Government targets	Reduce greenhouse gas emissions by at least 32% from a 2009 to 2010 baseline (in line with individual departmental targets).
External influences	• Defra review the electricity conversion factor each year based on national grid electricity production, which can significantly affect the calculation of Highways England's carbon footprint. A significant increase in the carbon intensity of grid electricity threatens success (a likely risk if UK grid fails to decarbonise). • De-carbonisation of the grid and 'green' vehicle development will benefit the measure.

RISKS

Field	Notes
To meeting target	• The government, via Defra, set and publish the conversion factors which translate an organisation's consumption into carbon dioxide equivalent emissions used to create the measure. Defra review the factors each year (see external influence above). • It is worth noting that electricity use is by far the major fuel/energy use due to the network energy consumption. Total electricity use makes up >90% of Highways England's carbon footprint and network energy consumption is greater than 85% of the electricity used (2016-17 data). Instead of the progressive de-carbonisation of grid electricity, the 2014 factor was a significant adverse shift, and worse than the 2009 factor. Any future anomalies, or an adverse trend in the carbon intensity of grid electricity, threaten to increase Highways England's carbon footprint. • The increase of some 560 miles of Smart Motorways and associated technology across the network may have an impact on performance, due to the subsequent increase in electricity usage. • Traffic Officer vehicle fuel use (diesel) has been steadily decreasing disguising the variability in Defra conversion factors for fuel use which are improved only marginally in 2014 (c.f. 2009). Rising customer expectations and service delivery risks reversing the positive trends of vehicle efficiency and optimising Traffic Officer deployment. • Office/control centre gas for heating is weather dependant and variable. • There has been an adverse trend with greater emissions from traffic officer fuel use, office gas consumption and business travel emissions in 2016-17. This is considered an indicator of work intensity increasing. Consequently, although a minor contributor to Highways England's carbon footprint (all 3 represent only 7%, 2016-17), the significant increase in activity is likely to threaten positive reductions here.
To reporting	Low risks to reporting: Highways England's carbon footprint is built from local data (meter readings and invoicing, etc), see type of data below, which has been collected historically and systems are in place and working.

METHODOLOGY

Field	Notes
Unit of measure	Carbon dioxide equivalents (or CO2e) in tonnes. Carbon dioxide equivalency is a quantity that describes the amount of carbon dioxide that would have the same global warming potential as a given mixture and amount of greenhouse gases, when measured over a

<table>
<tr><th>Field</th><th>Notes</th></tr>
<tr><td></td><td>specified timescale (generally, 100 years). It is the international quantity for carbon footprinting.</td></tr>
<tr><td>Type of data</td><td>Carbon dioxide equivalents (CO_2e) in tonnes associated with Highways England's activities.
The components of the Scope 1, Scope 2 and Scope 3 elements of Highways England's organisational carbon footprint are set out below:
<table>
<tr><th>Source</th><th>Scope</th><th>Coverage</th><th>Method of measurement</th></tr>
<tr><td>Facilities main offices & Regional Control Centres (RCCs)</td><td rowspan="2">Scope 1</td><td>Gas</td><td>Consumption from metered main offices and the RCCs</td></tr>
<tr><td>Traffic Officer Service (TOS) vehicles</td><td>Fuel – diesel</td><td>Traffic Management Directorate (TMD) fleet manager collates TOS fuel use (card purchases)</td></tr>
<tr><td>Facilities main offices & RCCs</td><td rowspan="2">Scope 2</td><td>Electricity</td><td>Consumption from metered main offices and the RCCs</td></tr>
<tr><td>Network energy</td><td>Electricity (roadside equipment incl. lighting and communications)</td><td>Consumption metered and unmetered</td></tr>
<tr><td rowspan="4">Business travel</td><td rowspan="4">Scope 3</td><td>Road – hire and grey fleets</td><td rowspan="4">Modal split of business travel is compiled from data collected in the HA Management Systems incl. iExpenses.</td></tr>
<tr><td>Rail</td></tr>
<tr><td>Air</td></tr>
<tr><td>Bus and taxi</td></tr>
</table></td></tr>
<tr><td>Geographical coverage</td><td>Office Gas Consumption (Scope 1). - from main offices and regional control centres.
Traffic Officer Fuel Consumption (Scope 1) – from the operation of the Traffic Office Service fleet of vehicles.
Network Electricity (Scope 2).- energy used on the Strategic Road Network (SRN) (roadside lighting and equipment, depots and outstations).
Office Electricity Consumption (Scope 2) - from main offices and regional control centres.
Business travel (Scope 3 business travel) – from all Highways England staff business travel (excluding commenting) from grey and hire fleet, rail, air and bus/taxi.</td></tr>
<tr><td>Baseline period</td><td>2013/14</td></tr>
<tr><td>Baseline value</td><td>98,476 tonnes CO_2e</td></tr>
</table>

Field	Notes
Historical data	Extract from published Annual Report 2013-14

Highways Agency Carbon Footprint from operating the Network				
GREENHOUSE GAS (GHG) EMISSIONS		2011-12	2012-13	2013-14
Gross Emissions (tonne CO2e)	Scope 1: Traffic officer fuel	5,327	4,664	4,416
	Scope 2 & 3: Indirect emissions from electricity consumption	91,647	89,946	86,069
	Scope 3 : Suppliers' emissions	411,124	203,648	303,620
Related Consumption	Traffic officer vehicle Diesel fuel (litres)	2,070,660	1,805,494	1,656,314
	Network Electricity (kWh)	185,833,676	181,229,661	178,006,121
Financial Indicators	Traffic officer vehicle Diesel fuel	£ 2,934,000	£ 2,752,000	£ 2,294,213
	Network Energy Expenditure	£22,121,000	£ 24,015,000	£ 25,401,311
Highways Agency Carbon Footprint of our offices and Control Centres				
GREENHOUSE GAS (GHG) EMISSIONS		2011-12	2012-13	2013-14
Gross Emissions (tonne CO2e)	Scope 1: Direct emissions from gas consumption	396	867	750
	Scope 2 & 3: Indirect emissions from electricity consumption	5,471	6,097	5,876
	Scope 3: Highways Agency Business Travel	1,202	1,288	1,365
Related Consumption Data	Estates (HA Offices) Electricity (kWh)	11,149,157	12,284,500	12,088,465
	Estates (HA Offices) Gas (kWh)	2,157,832	4,679,812	3,994,495
	Private Car Mileage (Million road miles)	1.226	1.253	1.24
	Hire Car Mileage (Million road miles)	1.402	1.62	2.8
Financial Indicators	CRC Related Expenditure	£ 1,024,290	£ 1,157,290	£ 251,200
	Expenditure on business travel	£ 3,136,000	£ 3,483,000	£ 4,618,000

Methodology and calculation

Data collection:

- Traffic Officer Service (fuel – diesel) amount of fuel purchased supplied monthly via fuel card supplier.
- Metered bills and unmetered bills from energy suppliers, and
- Unmetered network supplies are calculated using an electricity industry approved method.
- Highways England Offices – metered bills (gas and electricity) from energy suppliers.
- HA Management Information System (HAMIS) Travel Manager and Oracle.
- iExpenses (business travel).

Calculating the metric: Carbon footprint will cover the following activities under the three scopes as defined by the Greenhouse Gas Protocol:
Scope 1: office/control centre gas consumption and traffic officer vehicle fuel (diesel) consumption.
Scope 2: office/control centre electricity, network electricity (roadside lighting and equipment, depots and outstations) consumption.
Scope 3: staff business travel road (hire and grey fleets), rail, air, bus and taxi travel.

Field	Notes
	Example (illustrative, including example *conversion factors* not current) Scope 1 Gas consumption 3,200,000 kWh x *0.18523* = 592,736 kgCO_2e Diesel usage 2,400,000 litres x *2.672* = 6,412,800 kgCO_2e Total Scope 1 expressed in tonnes: 7,005 tCO_2e Scope 2 Electricity office consumption 1,100,000 kWh x *0.54522* = 599,742 kgCO_2e Electricity network consumption 205,000,000 kWh x *0.54522* = 111,770,100 kgCO_2e Total Scope 2 expressed in tonnes: 112,370 tCO_2e Scope 3 (business travel) Road hire and grey fleets 3,500,000 km x *0.20825* = 728,875 kgCO_2e Rail 5,800,000 km x *0.05651* = 327,758 kgCO_2e Domestic flight 140,000 km x *0.20515* = 28,721 kgCO_2e International flight 210,000 km x *0.116* = 24,360 kgCO_2e Total Scope 3 (business travel) in tonnes: 1,110 tCO_2e Scope 1, Scope 2 and Scope 3 (business travel) total summing the above: 120,485 tCO_2e.
Data collection frequency	Most data becomes available after month end and would be consolidated after year end.
Validation/ cleansing	*Data collection:* • Traffic Officer Service (fuel – diesel). Checked and validated by Operations directorate (OD) staff. • Metered bills and unmetered bills from energy suppliers, and unmetered network supplies. Checked and validated by Operations directorate (OD) staff. • Highways England Offices – metered bills (gas and electricity) from energy suppliers. Checked and validated by Finance and Business Services directorate (FBS) staff. • HA Management Information System (HAMIS) Travel Manager and Oracle. Checked and validated by FBS staff. • iExpenses (business travel). Checked and validated by FBS staff. Unmetered supplies are permissible under certain circumstances strictly in accordance with Statutory Instrument (SI) 2001 No. 32631 and implemented through the BSCP 520 Regulations.

Field	Notes
	Electricity (Unmetered Supply) Regulations 2001 SI 2001 No. 3263. Balancing and Settlement Code Procedures BSCP 520 Regulations – Unmetered Supplies Registered with SMRS (Supplier Meter Registration Service).
	Calculating the metric: Appropriate checks, including an overall overview of data, performance and trend in time are carried out by FBS staff once the PI is calculated.
Data quality score	There are multiple data sources which feeds into the PI, all of the data sources are assessed below and combined to provide one overall representativeness and accuracy score. Data Quality Score: 1A. • Traffic Officer Service's fuel purchased via fuel card supplier is considered robust: Representativeness 1/ Accuracy 1. • All network metered/invoiced data is considered to be robust: Rep1/Acc1. • For unmetered network energy, supplies are calculated using an electricity industry approved method: Rep1/Acc1. • All office metered/invoiced data is considered to be robust: Rep1/Acc1. • Highways England business travel data is retrieved from management systems and claims which are partially dependent on the information provided by users: Rep1/Acc1. It should be noted that all information related to carbon emissions reported in the Highways England's Annual Report has been subject to review by National Audit Office, as a result of requirements laid down by HM Treasury. Reliability: A: Process is sound and although not fully automated management are very satisfied with process. Errors in calculation are minimal, and appropriate checks, including an overall overview of data, performance and trend in time are carried out by FBS staff once the PI is calculated.

REPORTING

Field	Notes
Highways England reporting	Quarterly
Outside scope of assessment	The organisational coverage aligns with HM Treasury current minimum reporting requirements for Departments 'and Agencies' annual reports and current Greening Government Commitments. Emissions relating to suppliers, road users and staff commuting are outside the accounting boundary.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering & Standards Director
Delivery Manager	Principal Environmental Advisor

KEY INTERDEPENDENCIES

The full list of KPI/PI has been reviewed. There are considered to be no key interdependencies which are likely to have a direct or significant impact on the performance of Highways England's carbon footprint.

PI: Carbon dioxide equivalents (or CO2e) in tonnes associated with the Supply Chain's activities

Narrative: Measuring carbon dioxide, and other greenhouse gas emissions, for Highways England and its supply chain as it operates, maintains and improves the network. Changes in climate and the financial and socioeconomic consequences of this change are increasingly well understood. We will demonstrate that we are playing our part in helping reduce carbon dioxide, and other greenhouse gas emissions, in line with current and future government targets.

Definition: This metric will be split into two parts:

a) Carbon dioxide equivalents (or CO_2e) in tonnes associated with the activities of Highways England's supply chain

b) Carbon dioxide emissions equivalents intensity

The metric will focus on Highways England asset carbon footprint covering the supply chain construction and maintenance activities (embodied carbon dioxide equivalents in energy use, materials, transportation and waste removal) within Scope 3 as defined by the Greenhouse Gas Protocol.

In addition to absolute carbon footprint reporting (ie tonnes CO_2e), the metric should report carbon dioxide emissions equivalents intensity (ie tonnes CO_2e/£M spend).

Note - the intensity measure is not applicable to PFI operational networks as there is no direct correlation between payment and works, and therefore the carbon emissions. Their construction and maintenance activity is not often directly paid for as they receive a shadow toll. Consequently the relationship between works and expenditure is not direct. And while DBFO Company's activities *are* counted in the overall carbon footprint, they *cannot* be in the intensity measure.

KEY DEFINITIONS

GREENHOUSE GASES - A greenhouse gas (or GHG for short) is any gas in the atmosphere which absorbs heat, and thereby keeps the planet's atmosphere warmer than it otherwise would be. The main GHGs in the Earth's atmosphere are water vapour, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and ozone. GHGs occur naturally in the Earth's atmosphere, but human activities, such as the burning of fossil fuels, are increasing the levels of GHGs in the atmosphere, causing global warming and climate change.

Different greenhouse gases last in the atmosphere for varying lengths of time, and they also absorb different amounts of heat. The "global warming potential" (or "GWP") of a GHG indicates the amount of warming a gas causes over a given period of time (normally 100 years). GWP is an index, with CO_2 having the index value of 1, and the GWP for all other GHGs is the number of times more warming they cause compared to CO_2.

CARBON DIOXIDE - Carbon dioxide (CO_2) is the most common GHG emitted by human activities, in terms of the quantity released and the total impact on global warming. As a result the term "CO_2" is sometimes used as a shorthand expression for all greenhouse gases. A more accurate way of referring to a number of GHGs collectively is to use the term "carbon dioxide equivalent" or "CO_2e".
CARBON DIOXIDE EQUIVALENT (CO2e) - "Carbon dioxide equivalent" or "CO_2e" is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of CO_2 which would have the equivalent global warming impact. A quantity of GHG can be expressed as CO_2e by multiplying the amount of the GHG by its GWP. Eg if 1kg of methane is emitted, this can be expressed as 25kg of CO_2e (1kg CH_4 * 25 = 25kg CO_2e). "CO_2e" is a useful term: it allows "bundles" of greenhouse gases to be expressed as a single number; and it allows different bundles of GHGs to be easily compared (in terms of their total global warming impact).
"Carbon" is used as shorthand for referring to CO_2, or greenhouse gases/CO_2e in general.
The above concise definitions were adapted from an Ecometrica published paper (http://ecometrica.com/)
SUPPLY CHAIN - Here Highways England's supply chain is limited to the energy use, materials, transportation and waste removal of the supply chain involvement in: major project construction, asset support contract activity and managing agent maintenance, operation and construction activity. In addition, DBFO Company's activities *are* counted in the overall carbon footprint, they *not* in the intensity measure.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	a) No measure of success, reporting only b) Reduction in carbon dioxide emissions equivalents intensity
Assumptions	• There is an assumption that suppliers working for MP and OD will adhere to existing instructions and seek to ehance their own performance by providing timely and accurate carbon returns. • The assumption is a reduction in carbon intensity over time. The measured aspects of supply chain carbon relate to energy, materials, transportation and waste removal. • The collaborative delivery framework contract is pressing for efficiency and reduced carbon intensity. There are specific assumptions that energy will become less carbon intensive; that materials are reused, recycled and sourced with less embodied carbon; local sourcing, reducing transportation distances is favoured; and, that the concept of waste is eliminated.
Organisational dependencies	Cooperation of supply chain. Application of lean principles.
Government targets	N/A to supply chain Scope 3 specifically.

Field	Notes
External influences	De-carbonisation of the grid relating to energy use and material production and to a lesser extent transportation.

RISKS

Field	Notes
To meeting target	The significant increase in works in the first Roads Period will increase the supply chain carbon footprint. Embodied carbon in materials is the dominant component of the supply chain footprint. There is a risk that accelerated and increased infrastructure investment also undermines the supply and availability of 'green', local and lower carbon materials and this criticality causes adverse effects on the carbon intensity of the supply chain's works.
To reporting	Inaccurate and incomplete data from the supply chain risks undermining the PI. A new carbon reporting tool was launched in August 2015 (updated September 2016) with supporting guidance and training to improve reporting, and to better facilitate Highways England audit and management of returns. To encourage and maintain timely reporting reminders will be issued to MP and OD the month before (quarterly) reporting; with additional reminders in the reporting month if necessary. Nil or late returns will attract poor collaborative performance scoring until accurate reporting is complete. Asset delivery way of working is a new challenge to carbon reporting which the AD regions need to address.

METHODOLOGY

Field	Notes
Unit of measure	a) Carbon dioxide equivalents (or CO2e) in tonnes. b) Carbon dioxide equivalents intensity in tonnes (ie tonnes CO2e/£M spend).
Type of data	a) Carbon dioxide emissions equivalents (or CO2e) in tonnes associated with the activities of Highways England's supply chain. b) Carbon dioxide emissions equivalents intensity (ie tonnes CO2e/£M spend) associated with the activities of Highways England's supply chain.
Geographical coverage	N/A
Baseline period	a) 2013/14
Baseline value	a) 303,620 tonnes
Historical data	a) Data available from 2009-10

Field	Notes
Methodology and calculation	a) The components of the Scope 3 elements of the Highways England asset carbon footprint are the supply chain construction and maintenance activities expressed as embodied CO2e in energy use, materials, transportation and waste removal. b) This figure, in tonnes, is divided by £m spend to calculate the intensity figure. The Highways England carbon tool is available online at: https://www.gov.uk/government/publications/carbon-tool The approach mirrors other client tools seeking supply chain energy, materials, transportation and waste treatment data which is multiplied by national emission conversion factors to generate a carbon footprint.
Data collection frequency	Quarterly data is reported by the supply chain.
Validation/ cleansing	Historically Highways England has reported the supply chain carbon footprint, with no incentivisation for perverse behaviour. Creating the PI brings a risk as incomplete data/reporting would generate less carbon intensity. This is a risk which the new carbon tool and the processes around its completion is seeking to mitigate.
Data quality score	There are more multiple data sources which feeds into the PI, however all the data would be reported to Highways England via a common reporting tool and combined. Therefore one overall representativeness/accuracy and reliability score is given of 3C. Representativeness: The PI is seeking high representativeness (all construction, maintenance and operation with the exception of PFI activity in the intensity measure) the level achieved is likely to be good: Score 2. Accuracy: Historically there have been concerns over data accuracy. NAO and internal audit reviews have highlighted this with management actions. The new revised reporting tool is seeking to address these actions. Pending the tool being embedded accuracy can only be considered average. Score 3. Validity score is therefore 3. The level of reliability is linked with the process applied in turning the raw data into the PI. The process is not automated and requires some manual intervention, yet checking can be done to ensure PI is reasonable. Score C.

REPORTING

Field	Notes
Highways England reporting	Annually
Outside scope of assessment	The components of the Scope 3 elements of the Highways England asset carbon footprint are the supply chain construction and maintenance activities expressed as embodied CO2e in energy use, materials, transportation and waste removal. The metric does not measure emissions per additional lane km, which could be developed if desired in future.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering & Standards Director
Delivery Manager	Principal Environmental Advisor

KEY INTERDEPENDENCIES

The full list of KPI/PI has been reviewed. There are considered to be no key interdependencies which are likely to have a direct or significant impact on the performance of the supply chain carbon footprint. The scale of investment in the first Roads Period will significantly increase the carbon dioxide equivalents in tonnes associated with the activities of Highways England's supply chain.

PI: The number of flooding hotspots and culverts mitigated

Narrative: Highways England needs to ensure the network can withstand the effects of everyday and increasingly frequent extreme weather events, and reduce the risk of flooding to communities living adjacent to the network (from Highways England's SBP).
Definition: The metric measures the number of category A1, A and B flooding hotspots and priority culverts mitigated.

KEY DEFINITIONS
FLOOD - The accumulation or passage of water at the ground surface where it is not normally experienced.
FLOODING HOTSPOT - A length of network, usually defined from junction to junction, at risk of repeated flooding.
CULVERT - An enclosed conduit, usually a large pipe, for conveying a watercourse below the carriageway or adjacent ground.
PRIORITY CULVERT - A culvert that poses a risk of flooding.
MITIGATION - An intervention e.g. capital scheme or management measure that addresses and / or reduces the identified risk to acceptable levels.
FLOOD SEVERITY INDEX - An automated calculation on HADDMS that assesses the level of flooding impact on network traffic based on a combination of: road classification, traffic flows, impact on traffic ie closure and duration of impact. The flood severity index ranges from 0 to 10.

Risk Definitions for Flooding Hotspots:
RISK STATUS – The risk status for flooding hotspots is defined by the matrix below based on a combination of the number of floods and their severity of impact within the last five years. The severity of impact is defined by the most severe of either the impact of carriageway flooding as measured by the flood severity index or the most severe third party impact. The risk level is more severe if the flooding hotspot is not within an Environment Agency flood risk zone.

Risk Definitions for Priority Culverts:
RISK STATUS – The risk status for priority culverts is defined by the matrix below based on a combination of the number of floods and their severity of impact within the last ten years. The severity of impact is defined by the most severe of either the impact of carriageway flooding as measured by the flood severity index or the most severe third party impact.

	Overall Flooding Hotspot Risk Status (Defined by the most severe of that determined by the flood severity index or the third party impacts)			
	Number of flood events in last five years within the hotspot			
	> 5	2 to 5	1	0
The hotspot is not within an EA flood risk zone				
Flood severity index of most severe flood in last five years	> 5	2 to 5	1	0
7 to 10	A1 (Highest)	A (Very High)	A (Very High)	N/A
3 to 6	A (Very High)	A (Very High)	B (High)	N/A
0 to 2	B (High)	C (Moderate)	D (Low)	N/A
No flood in last five years	N/A	N/A	N/A	D (Low)
Most severe third party impact in last five years	> 5	2 to 5	1	0
Residential or critical infrastructure	A1 (Highest)	A (Very High)	B (High)	N/A
Commercial	A (Very High)	B (High)	C (Moderate)	N/A
Agricultural	B (High)	C (Moderate)	D (Low)	N/A
No impact in last five years	D (Low)	D (Low)	D (Low)	D (Low)
The hotspot is within an EA flood risk zone				
Flood severity index of most severe flood in last five years	> 5	2 to 5	1	0
7 to 10	A1 (Highest)	A (Very High)	B (High)	N/A
3 to 6	A (Very High)	B (High)	C (Moderate)	N/A
0 to 2	B (High)	C (Moderate)	D (Low)	N/A
No flood in last five years	N/A	N/A	N/A	D (Low)
Most severe third party impact in last five years	> 5	2 to 5	1	0
Residential or critical infrastructure	A1 (Highest)	A (Very High)	B (High)	N/A
Commercial	A (Very High)	B (High)	C (Moderate)	N/A
Agricultural	B (High)	C (Moderate)	D (Low)	N/A
No impact in last five years	D (Low)	D (Low)	D (Low)	D (Low)

	Overall Priority Culvert Risk Status (Defined by the most severe of that determined by the flood severity index or the third party impacts)			
	Number of flood events in last ten years caused by the culvert			
Flood severity index of most severe flood in last ten years	> 5	2 to 5	1	0
7 to 10	A (Very High)	A (Very High)	B (High)	N/A
3 to 6	A (Very High)	B (High)	C (Moderate)	N/A
0 to 2	B (High)	C (Moderate)	D (Low)	N/A
No flood in last ten years	N/A	N/A	N/A	D (Low)
Most severe third party impact in last ten years	> 5	2 to 5	1	0
Residential or critical infrastructure	A (Very High)	A (Very High)	B (High)	N/A
Commercial	A (Very High)	B (High)	C (Moderate)	N/A
Agricultural	B (High)	C (Moderate)	D (Low)	N/A
No impact in last ten years	D (Low)	D (Low)	D (Low)	D (Low)

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	The metric would be used to demonstrate proactive action at confirmed flood hotspot and priority culvert locations across the Strategic Road Network (SRN).

Field	Notes
Assumptions	• Under current contractual requirements service providers are required to undertake validation of identified very high and high risk flood hotspots and priority culvert locations. Validation requires desk and / or field investigation to confirm (or refute) the identified baseline risk assessment and hence suitability and business need for further action. For Asset Support Contracts (ASC) this is set out in the Asset Management and Operating Requirements (AMOR) under Part 5: Drainage, and for Managing Agent Contracts (MACs) the equivalent requirements are set out in the Area Management Memo (AMM) 122/10: Flood Risk Management and AMM 130/10: Priority Drainage Assets. For all areas (apart from Asset Delivery contracts) the requirements were reiterated in Contract Management Memo CMM 107/16: Validation of Priority Drainage Assets. • Current delivery of this metric is based upon existing service providers fulfilling their current contractual requirements and having capacity to do so. This would form the basis of a forward programme of activities that would be delivered through either maintenance and renewals schemes as business as usual or improvement schemes that could draw upon ring-fenced money.
Organisational dependencies	Mitigation of category A1, A and B flooding hotspots and priority culverts can be achieved through the following delivery mechanisms: 1) Major Projects directorate (MP) forward programme: where identified and validated flood hotspot and priority culvert locations are coincidental with planned major projects these should be addressed as part of scheme delivery and treated as business as usual. 2) Operations directorate (OD) maintenance and renewals: where cause of flooding associated with a flood hotspot and/or priority culvert is identified as a maintenance issue this should be addressed through the maintenance and renewals programme as business as usual. 3) Where residual flood hotspot and priority culvert locations that cannot be addressed through 1) & 2) remain, then bespoke schemes will need to be undertaken via the Environment Designated Funds. Where proposed improvements meet defined criteria within the Environment ring-fenced fund these funds should be available to support implementation of capital projects.
Government targets	To understand the risk of flooding from all sources and to develop long term plans to reduce the risks.

Field	Notes
External influences	The Flood and Water Management Act 2010 (FWMA) and its implementation. (The FWMA makes Highways England a Flood Risk Authority with defined responsibilities. As such Highways England is required to contribute towards the National Flood Risk Strategy and has a duty to undertake its flood risk responsibilities sustainably as defined in the Highways Act).

RISKS

To meeting target	• Effective coordination and implementation of activities by both MP and OD and programme management. • Capacity of supply chain to deliver. • Identification of cost effective solutions. • Agreement with Environment Agency on priorities on how to spend the ring-fenced funds • Successful validation of more high risk flood hotspots and priority culverts.
To reporting	• Effective recording of information on Highways Agency Drainage Data Management System (HADDMS).

METHODOLOGY

Field	Notes
Unit of measure	The number of category A1, A and B flooding hotspots and priority culverts mitigated.
Type of data	Source of Data: HADDMS Flood Hotspots and Priority Drainage Assets. (Currently operated on behalf of Highways England by Mott MacDonald – due for migration to IAM IS).
Geographical coverage	Entire SRN
Baseline period	The baseline is defined as the position as recorded on HADDMS at 01/04/15 and reflects data captured since 2010 and reported in the HADDMS monthly report.
Baseline value	No. of category A1, A and B mitigated locations : 1 .
Historical data	Business processes were developed and implemented on HADDMS in 2010 and were refreshed in 2013 and 2016. This data contains records of baseline risk levels, validated risk levels and whether or not a flooding hotspot or priority culvert has had any risk addressed i.e. mitigated and /or closed out as low risk requiring no further action.

Field	Notes
Methodology and calculation	*Data collection:* Data is entered into HADDMS by our service providers once they have undertaken a validation of a priority location.
	Calculating the metric: The number of validated category A1, A and B flooding hotspots and priority culverts mitigated is then extracted from HADDMS. HADDMS reporting has been developed to extract and report this requirement monthly based on information input into HADDMS.
Data collection frequency	Flood hotspot and priority culvert records are updated on HADDMS once an activity has been completed against an identified location i.e. risk validation and/or mitigation. Service provider drainage liaison engineers are responsible for uploading information onto HADDMS including records of assessments and mitigation. The risk status is changed allowing month on month comparison.
Validation/ cleansing	Data validation is undertaken by service providers to established guidelines and assessment practices. Once completed this is uploaded onto HADDMS. Reviews of data quality (in relation to validation exercises) are undertaken centrally by SES directorate on an ad-hoc basis. The quality of data is reviewed as part of any value management activity that supports advancement of any scheme.
Data quality score	3C – (Representativeness 1, Accuracy 5, Reliability C): The dataset has a national coverage however until an identified location is validated it cannot be mitigated. Once a priority location is validated the level of data accuracy will be very high but until then accuracy is compromised by various assumptions used to determine baseline risk status. Because at the moment <10% of identified priority locations have been validated from the overall data set accuracy is assumed to be low. A reliability assessment of C has been given because the process is partially automated and requires some manual intervention, but can be checked to ensure reasonableness.

REPORTING

Field	Notes
Highways England reporting	Annual reporting of action undertaken in year.
Outside scope of assessment	Mitigation of any locations which are not category A1, A or B.

APPROVAL PROCESS

Field	Notes

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	South and East team leader / Environment

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan Progress KPI	Delays in delivery of RIS commitments could result in reduced opportunities to deliver mitigation of identified priority locations.	To be determined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanisms i.e. OD and MP will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.
Pavement KPI	Delays in delivery of resurfacing programme could result in reduced opportunities to deliver mitigation of identified priority locations through associated fence to fence initiatives.	To be determined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanisms i.e. OD and MP will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.

PI: The number of outfalls and soakaways mitigated

Narrative: Highways England needs to treat pollutants before they enter the water system, and improve water quality through the installation of more sustainable drainage systems (from the SBP).
Definition: The metric measures the number of category A, B and C priority outfalls and soakaways mitigated.

KEY DEFINITIONS
OUTFALL - The point where one drainage system discharges to a watercourse.
PRIORITY OUTFALL – An outfall whose discharge poses a risk of pollution to surface waters
SOAKAWAY - This may be an underground pit, usually filled with large aggregate, or a chamber that enables water to soak into the ground.
PRIORITY SOAKAWAY - A soakaway whose discharge poses a risk of pollution to groundwater
MITIGATION - An intervention e.g. capital scheme or management measure that addresses and / or reduces the identified risk to acceptable levels.

Risk Definitions for Outfalls:
CATEGORY A (VERY HIGH RISK) - Where an assessment identifies a risk of pollution from an accidental spillage and/or a predicted failure of the Water Framework Directive Environmental Quality Standards for the receiving waterbody.
CATEGORY B (HIGH RISK) - Where an assessment process has identified a risk of soluble AND sediment pollution for short term highway runoff-specific thresholds.
CATEGORY C (MODERATE RISK) - Where an assessment process has identified a risk of soluble OR sediment pollution for short term highway runoff-specific thresholds.

Risk Definitions for Soakaways:
CATEGORY A (VERY HIGH RISK) - Where an assessment identifies a risk of pollution from an accidental spillage and/or a predicted pollution from routine road runoff within a Source Protection Zone 1 (with a depth of the unsaturated zone less than or equal to 5m).
CATEGORY B (HIGH RISK) - Where an assessment identifies a risk of pollution from routine road runoff within a Source Protection Zone 1 (with a depth of the unsaturated zone greater than 5m).
CATEGORY C (MODERATE RISK) - Where discharge is not within a Source Protection Zone 1, but where assessment has demonstrated a defined risk to groundwater from routine road runoff.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	The metric would be used to demonstrate proactive action at confirmed pollution locations across the Strategic Road Network (SRN). Interventions at these locations would contribute towards: • improved level of environmental protection to receiving waterbodies (recognising value of natural resource); and, • improved surface/groundwater quality as delivered through committed actions (i.e. this metric) as a programme of measures within Environment Agency (EA) River Basin Management Plans and subsequent improvement, as reported by the EA, of quality to target levels.
Assumptions	• Under current contractual requirements service providers are required to undertake validation of identified very high and high risk pollution locations. Validation requires desk and / or field investigation to confirm (or refute) the identified baseline risk assessment and hence suitability and business need for further action. For Asset Support Contracts (ASC) this is set out in the Asset Management and Operating Requirements (AMOR) under Part 5: Drainage and for Managing Agent Contracts (MACs) the equivalent requirements are set out in the Area Management Memo 130/10: Priority Drainage Assets. For all areas (apart from Asset Delivery contracts) the requirements were reiterated in Contract Management Memo CMM 107/16: Validation of Priority Drainage Assets. • Validation and mitigation of Category C priority assets can be undertaken when Category A and B sites have been addressed or if they are co-located with A and B assets and it is cost-effective to validate and mitigate the risk. • Current delivery of this metric is based upon existing service providers fulfilling their current contractual requirements and having capacity to do so. This would form the basis of a forward programme of activities that would be delivered through either maintenance and renewals schemes as business as usual or improvement schemes that could draw upon ring-fenced money.

Field	Notes
Organisational dependencies	Mitigation of category A, B and C priority outfalls and soakaways can be achieved through the following delivery mechanisms: 1) Major Projects directorate (MP) forward programme: where identified and validated locations are coincidental with planned major projects these should be addressed as part of scheme delivery and treated as business as usual. 2) Operations directorate (OD) maintenance and renewals: where pollution risk associated with a location is identified as a maintenance issue this should be addressed through the maintenance and renewals programme as business as usual. 3) Where priority outfall and soakaway locations that cannot be addressed through 1) & 2) remain, then bespoke schemes will need to be undertaken via the Environment Designated Funds. Where proposed improvements meet defined criteria within the Environment ring-fenced fund, these funds should be available to support implementation of capital projects.
Government targets	The Water Framework Directive required all water bodies in the UK to achieve good chemical and biological status by 2015.
External influences	The Water Framework (Directive) Regulations 2003 as implemented and enforced by the EA. Where highway discharges are proven to cause pollution and no action is taken, the EA has powers to prosecute.

RISKS

Field	Notes
To meeting target	• Effective coordination of activities and programme management by MP and OD. • Capacity of supply chain to deliver. • Identification of cost effective solutions. • Agreement with EA on priorities on how to spend the ring-fenced funds. • Successful validation of more outfalls and soakaways.
To reporting	Effective recording of information on Highways Agency Drainage Data Management System (HADDMS).

METHODOLOGY

Field	Notes
Unit of measure	The number of category A, B and C priority outfalls and soakaways mitigated.

Field	Notes
Type of data	Source of Data: HADDMS Priority Drainage Assets. (Currently operated on behalf of Highways England by Mott MacDonald – due for migration to IAM IS).
Geographical coverage	Entire SRN
Baseline period	The baseline is defined as the position as recorded on HADDMS at 01/04/15 and reflects data captured since 2010 and reported in the HADDMS monthly report.
Baseline value	No. of category A, B and C mitigated locations: 0.
Historical data	Data exists from 2010
Methodology and calculation	*Data collection:* Information input into HADDMS by our service providers once they have undertaken a validation of a priority location.
	Calculating the metric: Number of validated category A, B and C priority outfalls and soakaways mitigated (extracted from HADDMS). HADDMS reporting has been developed to extract and report this requirement monthly.
Data collection frequency	Information input into HADDMS by our service providers once they have undertaken a validation of a priority location.
Validation/ cleansing	*Data collection:* Data checking and cleansing is undertaken in accordance with design standards set out in HD 43 and IAN 147 in DMRB 4.2.
	Calculating the metric: Data checking and cleansing is undertaken in accordance with design standards set out in HD 43 and IAN 147 in DMRB 4.2.
Data quality score	3C – (Representativeness 1, Accuracy 5, Reliability C): The dataset has a national coverage however until an identified location is validated it cannot be mitigated. Once a priority location is validated the level of data accuracy will be very high but until then accuracy is compromised by various assumptions used to determine baseline risk status. Because at the moment <10% of identified priority locations have been validated from the overall data set accuracy is assumed to be low. A reliability assessment of C has been given because the process is partially automated and requires some manual intervention, but can be checked to ensure reasonableness.

REPORTING

Field	Notes
Highways England reporting	Annual reporting of action undertaken in year.

Field	Notes
Outside scope of assessment	Mitigation of any locations which are not category A, B or C.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	South and East Team Leader / Environment

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan Progress KPI	Delays in delivery of RIS commitments could result in reduced opportunities to deliver mitigation of identified priority locations.	To be determined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanisms i.e. OD and MP will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.
Pavement KPI	Delays in delivery of resurfacing programme could result in reduced opportunities to deliver mitigation of identified priority locations through associated fence to fence initiatives.	To be determined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanisms i.e. OD and MP will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.

Helping Cyclists, Walkers, and other Vulnerable Users of the Network

KPI: The number of new and upgraded crossings

Narrative: The SBP and RIS require Highways England to facilitate safe movement for vulnerable road users alongside and across the Strategic Road Network (SRN). At present the metrics for measuring the impact of interventions for cyclists, walkers and other vulnerable users is limited in their number and scope. A number of commitments have been made in Highways England's Accessibility and Cycling Strategies including the development of new metrics. These metrics are being developed over the course of the first Road Period, however, in the interim, the number of new or upgraded crossings provided for cyclists, walkers, and other vulnerable users will be used as a KPI.

Definition: The number of (completed) new and upgraded crossings for cyclists, walkers and other vulnerable users. The number of new crossings will be reported separately from the number of upgraded crossings.

KEY DEFINITIONS

NEW CROSSING - A network enhancement which addresses gaps in current provision providing a direct, attractive, accessible, continuous and safe crossing facility. Where separate facilities are provided for different users (pedestrians, cyclists, equestrians, they will still only be counted as a single physical crossing, but a breakdown of different user facilities will be reported on. A New Crossing can consist of several individual links to provide a meaningful facility.

UPGRADED CROSSING - Enhancements to existing facilities which improve crossing provision to a required standard and in line with requirements of new crossing facilities.

VULNERABLE USERS - Defined as those cyclists and pedestrians with sensory impairment, those with mobility difficulties and those who are particularly sensitive to personal security concerns, including older users and children.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Increase in the number of completed: a) new crossings; and b) upgraded crossings. This will be reported on an annual basis and disaggregated by region.
Assumptions	• Achieving the measure of success assumes that schemes being developed will identify opportunities for new and improved crossing facilities as part of their scheme proposals. These schemes may originate from the ring-fenced fund for cycling, safety and integration, or from Major Projects directorate (MP) and Operations directorate (OD) schemes.

Field	Notes
Organisational dependencies	The delivery of completed new and upgraded crossings is dependent on MP and OD schemes identifying opportunities for new and improved crossing facilities, as part of their scheme proposals, and then completing these schemes.
Government targets	Cycling and walking investment strategy 2017, Cycling Delivery Plan 2014, Public Sector Equality Duty 2012 – providing overarching policy frameworks and duties.
External influences	Local authorities, delivery partners and interest groups as appropriate: all are involved in assisting Highways England in identifying and delivering our schemes.

RISKS

Field	Notes
To meeting target	Success will be undermined if MP and OD do not understand the requirements for vulnerable road user groups, and incorporate measures within their programmes of work. Success is dependent on continuing to develop effective partnership working with local authorities, interest groups and wider stakeholders, to help identify the required programme of interventions.
To reporting	Success will be undermined if the approach to data collection is not developed fully and applied by the business on a consistent basis. Additional resource will be required to undertake this activity. Note: a baseline position on the number of current crossing facilities on the Network is not currently available, but it is intended for this information to be collated to build our understanding of our asset.

METHODOLOGY

Field	Notes
Unit of measure	Number of new and upgraded crossings
Type of data	Number of (completed) new and upgraded crossings
Geographical coverage	Entire SRN – 2015 reference network.
Baseline period	Not available
Baseline value	Not available
Historical data	Not available

Field	Notes
Methodology and calculation	*Data collection:* A pro-forma is made available to MP (Programme Office) and OD (Central Performance Team) who distribute to regions / project teams as appropriate and populate with the outputs to be claimed in month and a forecast for the remainder of the financial year. This is completed monthly by working day 4.
	Calculating the metric: The received data is collated by the Accessibility Team and the outputs disaggregated by region and type of crossing.
Data collection frequency	Data is collected monthly.
Validation/ cleansing	*Data collection:* The submitted pro-forma is approved by a Service/Asset Delivery Manager and submitted to the Accessibility Team along with supporting evidence monthly by working day 5. The Accessibility Team validate the evidence submission against the outputs claimed. The evidence required is a task / scheme completion certificate clearly stating the outputs along with supporting photographs. Prior to reporting in Highways England's Annual Report the Audit and Assurance Team will review and validate the claimed outputs against provided evidence.
	Calculating the metric: Outputs are validated against the evidence provided by the Accessibility Team. If evidence is not provided the outputs are not accepted.
Data quality score	To be confirmed.

REPORTING

Field	Notes
Highways England reporting	The Accountable Director will sign-off outputs and commentary monthly on working day 7, these are then included in the monthly corporate reporting submission on working day 8.
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable	Safety, Engineering and Standards Director

Field	Notes
Director	
Delivery Manager	Group Manager Safer Roads

KEY INTERDEPENDENCIES

The full list of KPI/PI has been reviewed. There are considered to be no key interdependencies which are likely to have a direct or significant impact on the performance of this indicator.

PI: Number of vulnerable user casualties (broken down by Cyclists, Pedestrians, Motorcyclists and Equestrians)

Narrative: Government require Highways England to provide PIs that measure the safety of vulnerable users. Improving safety on and beside the Strategic Road Network (SRN) for vulnerable users can help encourage people to use the facilities on offer.
Definition: Casualties in road traffic collisions on the SRN are reported by the police where injury has been sustained. The number of casualties is reported retrospectively on an annual basis via the validated STATS19 data which is released by the Department for Transport (DfT) on the last Thursday of June each year. Casualties are reported by both user group and severity of injury, enabling the safety of vulnerable users, ie pedestrians, cyclists and other vulnerable users, to be measured.
The annual report entitled 'Reported Road Casualties on the SRN provides a detailed breakdown of the data for the SRN, split by motorway and all-purpose trunk road (APTR), which includes casualty numbers and contributory factors.
In addition, annual 'Operational State of the Network Reports' are produced, which break down the validated STATS19 data to a regional level.

KEY DEFINITIONS
VULNERABLE USERS - groups of road users who, in relation to the extent of their road use, run a higher risk than the average road user, without themselves being a danger to other groups.
'Risk' refers to the chance that a person has of being injured or killed in the event of an accident. The categories of user within this group are defined below:
PEDESTRIAN - A person travelling on foot.
EQUESTRIAN - A person travelling on horseback.
MOTORCYCLIST - A person travelling on a powered two wheel motor vehicle.
CYCLIST - A person travelling on a non-motorised two wheel vehicle.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	To report on the number of vulnerable user casualties on the SRN.
Measure of success	The reporting of a reduction in the number of casualties across the vulnerable user groups.
Assumptions	• The completion of the investment programme as proposed as part of RIS and SBP. • We are assuming that we will receive some resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding guaranteed.

Field	Notes
	• We are assuming that we will be increasing our partnership working. • Ongoing improvements in vehicle technology will contribute to the reduction in the number of casualties on the network.
Organisational dependencies	• Effective scheme delivery in line with the investment programme as part of the RIS. This includes ring-fenced funding for safety. • Effective maintenance of the network infrastructure. • Effective incident management will result in fewer secondary incidents. This is likely to have a small positive impact on casualty numbers. • Effective improvements to increase level of compliance ie roadworthy vehicles and drivers who obey the rules of the road. This is a significant dependency. • The cumulative effect of the above will positively impact upon the reduction in the number of vulnerable user casualties on the motorway network which in turn will contribute to the achievement of the 40% reduction in KSIs.
Government targets	The Strategic Framework for Road Safety (2011) provides an outline of national targets and the RIS for the2015/16 – 2019/20 Road Period sets out the 40% KSI reduction target for SRN.
External influences	• Accuracy of data provided to DfT by the police. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70% as set out by the Association of Chief Police Officers (ACPO). • Government policy and resourcing of enforcement activity will have a significant impact on casualties on the motorway network if the levels of police enforcement continue to drop. • Changes in levels of traffic on the network, and developments within the automotive industry could influence casualty numbers. • Highways England's ability to work more closely with our partners to influence compliance and delivery of the Health and Safety 5 year plan. This document was published in September 2015 and includes both road users and road workers. The health, safety and wellbeing team are responsible for the road worker element of the plan and will liaise with the Health and Safety Executive (HSE) , whilst the Safer Roads Group are responsible for road user safety. • The cumulative effect of the above will influence the ability reduce the number of casualties.

RISKS

Field	Notes
To meeting target	• Conflicting priorities for investment resulting in a lack of funding for schemes and initiatives which would contribute towards meeting the target. • Marketing and advertising restrictions – preventing intelligence-led initiatives and campaigns from being undertaken. • Reliance on other partners/stakeholders to fund/undertake initiatives and campaigns. • Improving performance will also require resource funding for partnership working to help change driver behaviour and compliance. There is currently no resource funding. • The value management process does currently not incentivise prevention schemes – this may result in key schemes not getting funded. • Heavy Goods Vehicle (HGV) speed limits are increasing as at April 2014 – it is unclear the impact this may have, but it may increase the number of casualties.
To reporting	STATS19 - reliance on the police to provide accurate data when they collect it at the accident scene. This is currently deteriorating as a result of reducing police coverage. On roads police capability is down 70%

METHODOLOGY

Field	Notes
Unit of measure	Number of casualties for: Cyclists, Pedestrians, Motorcyclists, Equestrians .
Type of data	Number of Vulnerable User casualties broken down by: cyclists, pedestrians, motorcyclists and equestrians as derived in the STATS19 Road Accident dataset. (from 1 January to 31 December).
Geographical coverage	2015 referenced SRN
Baseline period	Average of 2005 – 2009 data
Baseline value	Pedestrian - 216 Equestrian – 0 Motorcyclist – 1,026 Cyclist - 150
Historical data	STATS19 data available from 1994
Methodology and calculation	*Data collection:* Road accidents on the public highway in Great Britain, reported to the police and which involve human injury

Field	Notes
	or death, are recorded by police officers onto a STATS19 report form. The form collects a wide variety of information about the accident (such as time, date, location, road conditions) together with the vehicles and casualties involved and contributory factors to the accident (as interpreted by the police). The form is completed at either the scene of the accident, or when the accident is reported to the police.
	Calculating the metric: The number of casualties is calculated on an annual basis from data extracted from the DfT validated data. The number of casualties is the sum of the number of fatal, seriously and slightly injured casualties.
Data collection frequency	STATS19 data provided by DfT on an annual basis on the last Thursday of June each year.
Validation/ cleansing	*Data collection:* The data recorded by the police on STATS19 is collated by the relevant local authorities who undertake an initial validation for their area. The data is then forwarded to DfT who undertake a further validation process for all UK data.
	Calculating the metric: Once the national data is released (annually), Highways England extracts the data for the SRN and plots it against the referenced network, enabling any discrepancies to be identified. The number of casualties is calculated on an annual basis from the SRN data extracted from the DfT validated data. This information is sense checked and compared to that of the previous years.
Data quality score	2C **Validity** = 2 1 = The number of casualties are correct and all are reported. There are no errors in this value. 2 = The data represents the entire SRN and there are no holes. However, as noted in the risks to reporting, police coverage and capability are a potential issue. **Reliability** The process is not automated and is therefore a C.

REPORTING

Field	Notes
Highways England reporting	In year casualty numbers for the vulnerable user groups are reported at the end of June the following year (eg 2013 data is reported in June 2014).
Outside scope of	There may be a requirement to capture and record casualties that fall outside the referenced network, which

Field	Notes
assessment	is outside of the scope of this indicator. This information is captured on an annual basis.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Safety Action Plan Coordinator

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Amount of traffic PI	An increase in traffic levels may result in an increase in risk to vulnerable users.	Exact linkage is currently undefined.	No management is in place at this stage.
Average speed PI	An increase in average speed may result in an increase in risk to vulnerable users.	Exact linkage is currently undefined.	No management is in place at this stage.
New and Upgraded Crossings KPI	An increase in the number of new and upgraded crossings may result in a decrease in risk to vulnerable users.	Exact linkage is currently undefined.	No management is in place at this stage.
IRAP PI	An improvement in IRAP score may result in a decrease in risk to vulnerable users.	Exact linkage is currently undefined.	No management is in place at this stage.
Annual cycling programme PI	Progress on the annual cycling programme may result in a decrease in risk to vulnerable users.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Identification and delivery of the Annual Cycling Programme

Narrative: Government has stated that it wants to enable choice, so people can be more active by walking or cycling. Accordingly, although some vulnerable users are not allowed on motorways, we will seek to facilitate the safe movement of vulnerable users across and alongside the Strategic Road Network (SRN) to address these barriers. A number of commitments have been made in Highways England's Accessibility and Cycling Strategies, including the development of new metrics. These metrics are being developed over the course of the first Road Period, however, in the interim, the delivery of the Annual Cycling Programme will be used as a PI. Improving safety on and beside the SRN for vulnerable users can help encourage people to use the facilities on offer.

Definition: Each year, an annual cycling programme for development and delivery will be defined. As part of this programme, there will be a certain number of schemes which are due to begin design; a certain number which are due to finish design; a certain number which are due to start work; and a certain number which are due for completion of work.

Highways England will set out the expected number of schemes for development and delivery in April each year and then report on our performance as part of the annual report at to show whether those expectations were met. The annual cycling programme consists only of schemes which are funded from the Cycling, Safety and Integration Designated Fund.

KEY DEFINITIONS

A scheme in this context is an improvement to the network, using the ring-fenced funds, which is focused on improving provision for cyclists and other users through better road design and traffic management.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Success will be if the expected number in the annual programme, are achieved or exceeded.
Assumptions	Achieving our annual programme assumes: • Ring-fenced funds are available and the proportion of the fund attributed to cycling remains the same; • No significant traffic management conflicts with major schemes on or off the SRN; • The cooperation of any third parties involved in delivering schemes; • No significant risks associated with Highways England, local authority or private developer competing priorities; • No significant land ownership / acquisition issues.

Field	Notes
Organisational dependencies	Delivering success is dependent on Major Projects directorate (MP) and Operations directorate (OD) completing the relevant ring fenced funded schemes they have committed to and that there are no significant traffic management conflicts or competing priorities with other Highways England schemes.
Government targets	The government has an ambition to make walking and cycling the natural choices for shorter journeys, or as part of a longer journey. The government aims to double cycling activity by 2025 (from 2013 ref).
External influences	Some schemes may be delivered by local authorities or other third parties.

RISKS

Field	Notes
To meeting target	• There may be instances where the planned annual cycling programme may be altered. This may be to ensure better value for money, or to combine schemes to create efficiencies. Any changes to the overall programme will be explained in the annual report. • There is a chance that the scope of schemes which we have planned at the start of the year may alter. For example, the scope of a scheme may increase or the chosen design option may change. This would affect the annual programme, but can be explained in this indicator's end of year annual report. •
To reporting	• There may be risks in obtaining sufficient information from third party partners on any schemes they are progressing. This risk will need to be taken into account by project sponsors, who will need to ensure clear reporting mechanisms for each relevant scheme.

METHODOLOGY

Field	Notes
Unit of measure	Number of schemes (comparison of expected outcome vs the actual outcome at the end of the year) split by: • Schemes due to begin design; • Schemes due to finish design • Schemes due to start work; • Schemes due for completion.
Type of data	Number of schemes (comparison of expected outcome vs the actual outcome at the end of the year) split by: • Schemes due to begin design;

Field	Notes
	• Schemes due to finish design • Schemes due to start work; • Schemes due for completion.
Geographical coverage	Schemes can be anywhere on the 2015 referenced SRN.
Baseline period	N/A
Baseline value	N/A
Historical data	2015/16 21 schemes were delivered 2016/17 33 schemes were delivered
Methodology and calculation	*Data collection:* Funding has been allocated to each region and regions have responsibility for defining their cycling programmes. The development of these programmes takes into account four main factors: • Stakeholder priorities; • Cyclist safety; • Connectivity / economic issues; and • Accessibility issues. A number of tools and guidance have been provided to assist the regions in developing their programmes. This includes an online geographical tool which can be used to identify areas with potential supressed demand and a prioritisation framework to assist the regions in identifying which schemes to take forward. Additionally, the Cycle Scheme Appraisal Report (SAR) tool is applied and a resultant programme defined. A pro-forma is made available to OD (Central Performance Team) who distribute to regions / project teams as appropriate and update milestone dates for the cycling programme and any completed schemes. This is completed monthly by working day four. Formal Change Controls are to be submitted for the insertion / removal of any scheme in the programme.
	Calculating the metric: These monthly updates are used to update the cycling programme and expected delivery dates. Any schemes for which information is not provided (e.g. if delivered by third parties) will be contacted individually. The number of schemes completed in the financial year to date is reported.

Field	Notes
Data collection frequency	Milestone dates for each scheme are updated and changes made to the programme monthly.
Validation/ cleansing	*Data collection:* The submitted pro-forma is approved by a service/asset delivery manager and submitted to the Accessibility Team, along with supporting evidence monthly by working day five. The Accessibility Team validates the evidence submission against the outputs claimed. The evidence required is a task / scheme completion certificate clearly stating the outputs along with supporting photographs. Prior to reporting in Highways England's Annual Report, the Audit and Assurance Team will review and validate the claimed outputs against provided evidence. Any subsequent issues/risks will be escalated as appropriate.
	Calculating the metric: Outputs are validated against the evidence provided by the Accessibility Team. If evidence is not provided the outputs are not reported.
Data quality score	a) Data Quality Score: 3B The representativeness of the data is classed as 3. The annual cycling programme only considers cycling interventions which are funded by the ring-fenced funds. The accuracy of the data is classed as 2: Updates will be collated directly from Oracle on a monthly basis, which will be checked and challenged prior to this by project sponsors. Progress will be monitored by the cycling working group with performance issues addressed as appropriate. As such, the validity score is 3. The reliability of the data is classed as B, because the process is partly automated, checked by at least two people, and management are satisfied with the process.

REPORTING

Field	Notes
Highways England reporting	Updates on the programme are collated directly from Oracle on a monthly basis to track progress, culminating in a final end of year report each April illustrating performance against the previous year's plan, providing commentary on any variances.

Field	Notes
Outside scope of assessment	This measure relates to cycling schemes funded by the ring fenced funds only.- it does not include Major Projects, or Local Network Management Schemes, etc. Despite measuring cycling schemes, these schemes may also benefit walkers and other vulnerable users of the network.

APPROVAL PROCESS

Field	Notes
Accountable Director	Safety, Engineering and Standards Director
Delivery Manager	Accessibility Advisor

KEY INTERDEPENDENCIES

The full list of KPI/PI has been reviewed. There are considered to be no key interdependencies that are likely to have a direct or significant impact on the performance of this indicator.

Achieving Real Efficiency

KPI: Savings on capital expenditure

Narrative: We will report on the extent to which we are on track to deliver the capital efficiencies as outlined in the Performance Specification for the first Road Period. This will provide reassurance that we are able to deliver the Investment Plan in a timely and efficient manner.

Cost savings on capital spending of at least £1.212 billion are to be achieved by the end of the first Road Period, on capital expenditure. We will demonstrate how these efficiencies have been achieved. The scope for efficiency savings targets will be defined by the programme set out in the annual Delivery Plan.

Note: The framework for how efficiency will be reported and monitored remains under development and will be agreed between the Department, Highways England and the ORR as part of developing the Efficiency and Inflation Monitoring Manual by September 2015. The information in this KPI template will also be updated accordingly.

Definition: Government is creating a new governance framework for the management of the Strategic Road Network (SRN) that will generate more cost savings for the taxpayer and deliver better outcomes for road users. By managing the network within a governance framework similar to other infrastructure companies and operators, we should be able to deliver significant efficiency savings, both in the first Road Period and beyond. We have agreed to deliver £1.212 billion savings on capital expenditure by the end of the first Road Period. This is within the context of delivering long term efficiency savings of at least £2.6 billion as efficiencies ramp up during the second Road Period.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	£1.212bn
Measure of success	Demonstrating that the organisation has generated capital efficiency savings of the target value through the delivery of the capital programme stated in the Investment Plan at a value below the 2014-15 baseline in the course of delivering its capital programme.
Assumptions	The target is based on the following assumptions: • Target value stated includes assumed inflation basis (see later in template); • Actual inflation is in line with forecast rates (see later in template); • Whole value of capital spend stated in the Investment Plan is made available and delivered • Balance of funding allocated to types of schemes as detailed in the Investment Plan remains unchanged.
Organisational dependencies	A key part of the success of the KPI is the organisation working in a coordinated manner from planning of schemes and renewals, procurement and, particularly, the focus on regional programming. This should be

Field	Notes
	reflected in the Delivery Plan.
Government targets	N/A
External influences	• Assumed inflation is included within the target value, actual inflation may vary. Where this occurs, outturn cost figures will be adjusted to take account of the change in inflation as will future forecasts of inflation. • Political changes which vary the Investment Plan would impact this KPI.

RISKS

Field	Notes
To meeting target	• Identifying and implementing sufficient interventions to deliver efficiencies at the level targeted. This risk will be mitigated by the development of the Delivery Plans. • There is a risk that there will not be enough capacity in the construction sector to deliver the capital programme. Mitigation will be through the Delivery Plans. • Inflation exceeding assumptions made in the Funding Model meaning insufficient capital budget is available to deliver the full programme. Should this happen then a mitigation would be that the outputs along with the efficiency target would have to be adjusted.
To reporting	There is no current established process across the organisation in collecting efficiencies in this global manner and so there is a risk to the accurate and complete recording and reporting of this KPI. A new framework process for identifying and capturing efficiencies is under development and will be fully implemented in the period up to September 2015. Once approved this will be worked into the business in detail through a series of workshops. The approach to reporting will be updated in this section once developed further.

METHODOLOGY

Field	Notes
Unit of measure	GBP
Type of data	See methodology
Geographical coverage	N/A

Field	Notes
Baseline period	The baseline metric is based on the Funding Model developed for the first Road Period which formed the basis for the Efficiency Review which generated the target value. The baseline period is 2015-2020 as per the first Road Period. The process will be that the targets will be reviewed on an annual basis as part of the delivery plan update and future year forecasts adjusted as appropriate.
Baseline value	£1.212bn
Historical data	None – this is a process and KPI new to the organisation.
Methodology and calculation	*Data collection:* A framework for capturing, recording and evidencing efficiencies is under development (see Risk to Reporting above). To be known as the Efficiency Manual, it is expected to be specified by the September 2015 with development ongoing in the early stages of the first Road Period. This section will be updated once the framework is approved and the detail of how the implementation will operate has been developed through workshops with the business. As an initial view the description below gives an overview: Data will be collected through project and programme registers using various processes through the organisation. As the data will be manual all efficiency submissions will require approval by the Finance Business Partners. The data will be collected through the Strategic Finance area within Financial Control. Key to the process will be the evidence supporting the efficiency submission and the internal review to ensure that the evidence is clear and supportable and will respond to challenge from the highways monitor and the National Audit Office.
	Calculating the metric: All efficiency registers from individual schemes or programmes will be summarised into a standard base data template. Where templates have not been received in a timely manner, the previously received register will be used. Efficiency Reporting Managers (directorate individual responsible) will be the first source of checking completeness of the returns from the efficiency managers (scheme responsible). Base data template will also be reviewed for completeness with exception reporting showing the relative age of registers used and any missing data. Adjustments will be made to adjust the actual figures to be presented on a consistent basis, removing the impact of inflation variations. Assumed inflation figures are shown below. Resource inflation is to use the Consumer Price Index (CPI). Capital inflation will use an index compounded from various construction indices – this will be defined through the Commercial and Procurement Group. Total efficiency will be the summation of the inflation adjusted efficiency registers.

<table>
<tr><th>Field</th><th>Notes</th></tr>
<tr><td></td><td>
<table>
<tr><td>Inflation Assumptions</td><td>2015-16</td><td>2016-17</td><td>2017-18</td><td>2018-19</td><td>2019-20</td></tr>
<tr><td>Capital - compound of construction indices</td><td>4.0%</td><td>4.0%</td><td>4.0%</td><td>5.0%</td><td>5.0%</td></tr>
<tr><td>Resource – Consumer Price Index (RPI)</td><td>3.2%</td><td>3.1%</td><td>3.3%</td><td>2.5%</td><td>2.5%</td></tr>
</table>
</td></tr>
<tr><td>Data collection frequency</td><td>The efficiency registers will be sent to the centre on a monthly basis for extraction of the efficiency data. This will be collated into a single spreadsheet which will form the base data for all efficiency reporting. Depending on the timescales it may not be possible to chase up slow returns and so exception reporting will be required to allow the base data to be judged and to ensure action is taken to address managers not following the process in a timely manner.
Detail on this will follow once the framework is approved and workshops develop the detail on how the process will work.</td></tr>
<tr><td rowspan="2">Validation/ cleansing</td><td>Data collection:
Validation will be carried out by both the Finance Business Partners and Efficiency Reporting Managers within the business. How often and on what timescale this is to be done will be defined through the workshops. Also, timescales will have to fit within the OMM reporting collation and generation timescales. A further quality control review will be done by Strategic Finance as data are gathered in the centre for reporting. Strategic Finance will also carry out regular deep dives into a sample of registers to ensure quality.</td></tr>
<tr><td>Calculating the metric:
The KPI will be generated from the base data brought through from the Efficiency Registers. This will be categorised to give some analysis between efficiencies which have been delivered (completed schemes), identified and under way, and identified and not yet recognised (these categories to be further developed).</td></tr>
<tr><td>Data quality score</td><td>Representativeness – 1 – will use all available data and will be completed for all projects by the people responsible on those projects.
Accuracy – Can’t give a score on that currently as there is no process. So for now will score as 5. However as the process is implemented it will improve through RP1.
Reliability – D currently (as no process) – as process is developed should reach C (not automated, manual intervention, however checking will be in place throughout the process).
Current Score – 3C</td></tr>
</table>

REPORTING

Field	Notes
Highways England reporting	Reporting will be done on a monthly basis, however due to the manual nature of the process under development this may cause issues. The exact nature of monthly reporting will be developed as the process is completed – particularly through the workshops. It could be that data is one month in arrears for monthly reporting. It also could be that there is less ability for approval or validation of the monthly reporting data and so could be reporting data subject to review. Quarterly reporting will be done which will have approval, validation and review stages complete. This will form the formal reporting of the progress against target.
Outside scope of assessment	N/A

APPROVAL PROCESS

Field	Notes
Accountable Director	Commercial and Procurement Director
Delivery Manager	Finance Divisional Director

KEY INTERDEPDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan Progress KPI	Faster progress may have either positive or negative impacts on this KPI	Will depend on reasons for change in KPI performance	Central review and monitoring
Progress of Major Schemes PI	Faster progress may have either positive or negative impacts on this KPI	Will depend on reasons for change in KPI performance	Central review and monitoring

KPI: Delivery Plan Progress: progress of work, relative to forecasts set out in the Delivery Plan, and annual updates to that Plan, and expectations at the start of RP1.

Narrative: As part of the Delivery Plan, and annual updates to it, which sets out delivery of the Investment Plan, Highways England will provide a forecast of how work will be progressed during the year ahead. We will report on actual progress relative to both the forecasts provided in the annual updates to their Delivery Plan and expectations set at the start of RP1.

Note: The framework for how the Delivery Plan will be reported and monitored is still under development and will be agreed between the Department, Highways England and ORR.

Definition: This KPI will measure progress against a number of key strategic outputs and interventions set-out within Highways England's Delivery Plan, and subsequent annual refreshes of the Delivery Plan.

KEY DEFINITIONS

The key terms and phrases for this KPI are as follows:

DELIVERY PLAN - Describes the preparation and publication of a 'Delivery Plan' for every Road Period, as a requirement of Highways England's Licence. The 'Delivery Plan' sets out how we will achieve Government's objectives and long-term vision for the Strategic Road Network (SRN). It sets out exactly what Highways England will deliver for this Road Period (RP1) covering 2015 to 2020, including how we will: use our budget allocation; effectively manage our asset; deliver outcomes for our customers; transform our organisation and be more effective; and measure our success. The 'Delivery Plan' builds on Highways England's SBP.

WORK - Describes activities, interventions, programmes or outputs that; Highways England, its employees and contractors, and its supply chain are delivering to achieve what has been set-out within the 'Delivery Plan' or subsequent 'annual updates' of that Plan.

FORECASTS - Describes the commitments made within the Delivery Plan to achieving or delivering 'work', by a specific date or programme milestone.

ANNUAL UPDATES - Describes the process of updating or refreshing our plans and programmes of 'work' and 'forecasts', on an annual basis throughout any given Road Period.

EXPECTATIONS - Describes what Government have set-out within their RIS, Performance Specification and Highways England's Licence for our organisation to deliver over the course of the Road Period. It also describes Highways England's statements of reliance on external partnerships, and the risks that we have set-out as been outside of our control and the impact that those risks will have on delivery of key 'work' by the committed 'forecasts'.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	Meet or exceed 'forecasts' within the 'Delivery Plan' or subsequent 'annual updates' of that Plan.
Measure of success	Success will be achieved if Highways England meets or exceeds the 'forecasts' of 'work' set out within the 'Delivery Plan'. Performance against this indicator will be measured across a number of key strategic outputs and interventions, which will be tracked through a performance dashboard, providing an overall rating of achievement against the 'Delivery Plan'.
Assumptions	• Highways England's performance will be measured against the latest 'forecasts' contained within the most recent 'Delivery Plan' or 'annual update' of that Plan, as agreed by the then Secretary of State for Transport on behalf of Government. • The key strategic outputs and specific interventions that will be tracked within the performance dashboard will be agreed by Highways England and the Department for Transport, and fixed for the remaining duration of the Road Period that they relate to. • We will not duplicate measuring the performance of other KPIs, PIs or deliverables contained within Government's performance specification. Should performance against other KPIs form part of the performance dashboard, we will track the value of that KPIs performance directly from the relevant indicator. We will focus on measuring performance of other agreed areas of 'work' and 'forecasts' contained within the 'Delivery Plan'. • We will ensure performance is monitored against the entirety of the 'Delivery Plan'; the key strategic outputs and specific interventions will not be weighted by their perceived relative importance, or investment line contained within Highways England's funding profile. • Where this KPI continues to exist within the Government's Performance Specification of any future Road Period, the key strategic outputs and specific interventions will be revised to reflect the Government's and Highways England's priorities of the that Road Period. • Where a RIS is re-opened and amended by Government; the impact of a change to Highways England's funding profile, or the 'work' and 'forecasts' that it is required by Government, or Highways England has been committed to deliver, will be taken into account when measuring performance against this KPI.
Organisational dependencies	Delivering success will be dependent on a fixed, clear and shared understanding of the 'work' and 'forecasts', which the Department for Transport and Highways England have agreed form the basis of those key strategic outputs and specific interventions that this KPI is measuring performance against.

Field	Notes
Government targets	Performance against other KPIs (if included) and where relevant the targets; will feed into the performance dashboard for this KPI, which in-turn contribute towards the overall rating of achievement against the 'forecast' set-out within Highways England's 'Delivery Plan'. No specific targets outside of Government's Performance Specification will influence this KPI.
External influences	Until the Department for Transport and Highways England agree the key strategic outputs and specific interventions that fall outside of measurement of other KPI measurement that this KPI will track, it is not possible to identify those external influences that impact success against this KPI. We will re-consider those external influences in relation to tracking progress of 'forecasts' in the 'Delivery Plan' in the first quarter of RP1. We will update this template by [July 2015] to reflect the agreed key strategic outputs and specific interventions.

RISKS

Field	Notes
To meeting target / measure of success	A re-opening of the RIS, and its associated Performance Specification requirements may alter what we are measuring and reporting success against for this KPI. Highways England will mitigate against this risk through a process of agreement with the Department for Transport, to accurately reflect any required changes to the methodology of measuring success against this KPI.
To reporting	On-time reporting of all KPIs and other 'work' against 'forecasts' that feed into this measuring success against this KPI will be critical to providing quarterly updates of progress to the Department for Transport and the Roads Monitor (ORR). Strategy & Planning directorate of Highways England will mitigate this reporting risk by regular communication and close interaction with the wider business, to ensure performance against other KPIs and agreed areas of 'work' are feeding into the performance dashboard for this KPI, by the set deadlines of the performance monitoring team.

METHODOLOGY

Field	Notes
Unit of measure	N/A
Type of data	N/A
Geographical	N/A

Field	Notes
coverage	
Baseline period	N/A
Baseline value	N/A
Historical data	N/A
Methodology and calculation	N/A
Data collection frequency	N/A
Validation/ cleansing	N/A
Data quality score	N/A

REPORTING

Field	Notes
Highways England reporting	Quarterly
Outside scope of assessment	Different for each of the KPIs/PIs/Requirements.

APPROVAL PROCESS

Field	Name
Accountable Director	Strategy and Planning Director
Delivery Manager	Delivery plan manager, Strategy & Planning

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
See other KPIs/PIs	N/A	N/A	N/A

PI: CPI and SPI for schemes at Project Control Framework Stage 5 and beyond

Narrative: Demonstrate that the portfolio is being developed and the Investment Plan delivered in a timely and efficient manner. This should include the progress of major schemes and programmes in construction through reporting Cost Performance Indicator (CPI) and Schedule Performance Index (SPI) for schemes beyond Project Control Framework Stage 5.

Definition: This PI relates to the major improvement programme and applies after PCF (Project Control Framework) stage 5.

The earned value scope covers all costs (excluding programme risk, lands and salaries) for the major improvement programme. It covers performance throughout the construction phase of the PCF.

The process is owned by Commercial Services (to create effective governance) and has an audit trail showing performance of suppliers and schemes (incorporating employer risk)

Performance is reported on a monthly basis to project managers, the Major Projects Business Meeting and the Highways England Executive Group. It includes trend information, a summary explanation of reasons for time and cost variations, mitigation in hand and forecast of the timing and effectiveness of mitigation action. This information is reviewed by project managers, Senior Responsible Owners (SROs) and Directors in order to demonstrate control of time/cost and ensure that forecasts are robust.

KEY DEFINITIONS

CPI - cost performance index

This is the ratio of value earned (budgeted cost of work performed to date) to actual cost to date .This shows the cost of delivery against the target cost where 1.00 means actual cost = target price

SPI - schedule performance index

This is the ratio of value actually delivered (budgeted cost of work performed to date) to value scheduled to be delivered to date. This shows the rate of progress against the agreed schedule where 1.00 = delivering exactly to planned schedule.

Highways England operates against the PCF for the major improvement programme (similar to GRIP for Network Rail). PCF stage 6 is construction where earned value is operated.

EVM - Earned Value Management

SRO - Senior Responsible Owner, who is accountable for the delivery performance of the scheme and/or major improvement programme of work

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	N/A
Measure of success	Programme CPI and SPI of at least 1.00 at the aggregated level.
Assumptions	• Target of at least 1.00 is for construction programme. Both CPI and SPI are frozen at the point at which a scheme opens for traffic. • Baseline is credible from suppliers and accepted by the Senior Responsible Owner. • There are no substantial changes from the scope. • Target price and planned schedule are fair and reasonable. • Programme delivery partner will assist in transitioning from project to programme delivery. • Does not include activity prior to construction.
Organisational dependencies	N/A
Government targets	N/A
External influences	Weather related events, Air Quality legislation, ministerial approvals and competing for supply chain resource with other clients. External factors affecting progression of time and cost.

RISKS

Field	Notes
To meeting target	• Weather related events. Competing for supply chain resource with other clients such as HS2. Reliance on Statutory Undertakers/Utility providers to meet our programme dates. Strategic changes in the way work is delivered could affect baselines. • To mitigate risks, a realistic risk assessment is built into schedules and robust change management is implemented through construction. Changes to baseline are authorised by the Senior Responsible Owner. Routine internal EVM audits are carried out.
To reporting	Changes to reporting scope. IT/System capability issues. Data quality verification. Engagement with delivery stakeholders Schedule acceptance by the Senior Responsible Owner.

METHODOLOGY

Field	Notes
Unit of measure	CPI & SPI at a programme level for the major improvement programme.
Type of data	A commercial return (CRaMS - commercial reporting and monitoring system) from the supply chain is produced monthly.
Geographical coverage	This PI relates to construction and therefore should only apply after Project Control Framework stage 5. It covers the major improvement programme in construction on the Strategic Road Network (SRN) in England.
Baseline period	N/A
Baseline value	N/A
Historical data	Improvement schemes/programme from 12/13. EVM reported in Accounts relates to programme CPI and SPI for major improvement schemes in construction ie post PCF stage 5.
Methodology and calculation	*Data collection:* The principal data is collected via a monthly commercial reporting and monitoring system (CRaMS) produced by the supplier and project manager. The earned value scope covers all costs (excluding programme risk, lands and salaries) for the major improvement programme in construction. It covers performance throughout the construction phase A change control procedure applies to the baselines and budgets. Both CPI and SPI are frozen at the point at which a scheme opens for traffic.
	Calculating the metric: The CPI and SPI are derived from information contained in the CRaMS forms and supplemented by internal data At a programme level CPI = Budgeted Cost of Work Performed/Actual Cost of Work Performed At a programme level SPI = Budgeted Cost of Work Performed/Budgeted Cost of Work Scheduled
Data collection frequency	Data is collected monthly

Field	Notes
Validation/ cleansing	*Data collection:* The process is owned by Commercial services (to create effective governance) and the principal data collection is via the monthly commercial reporting and monitoring system (CRaMS). The CPI and SPI are derived from information contained in this form and supplemented by internal data. There is an audit trail showing performance of suppliers and schemes (incorporating employer risk). A commercial assurance process is in place and internal audit routinely review controls. Through the Commercial Framework in place at the time (currently PSF Lot 3), a tendering process will appoint commercial assurance consultants who review and validate the information supplied on CRaMS. Once they are satisfied with the data, it is passed on to Highways England who undertakes additional selective validation. This information is reviewed by Project Managers, Senior Responsible Owners and Directors in order to demonstrate control of time/cost and ensure that forecasts are robust. Variance explanation and mitigation plans are also subject to commercial assurance.
	Calculating the metric: Comparison against previous monthly performance is carried out as part of control of CPI and SPI performance.
Data quality score	2B The representativeness of the data is classed as 1. The major improvement programme is considered in calculating this indicator The accuracy of the data is classed as 2, as it is acknowledged that some small budget errors may occur. . The reliability of the data is classed as B, as appropriate checks are carried out to ensure the PI is valid, and management is satisfied with the process of calculation and assurance for the final PI score from the individual scheme data.

REPORTING

Field	Notes
Highways England reporting	Monthly
Outside scope of assessment	This PI relates to the major improvement programme in construction.

APPROVAL PROCESS

Field	Notes
Accountable Director	Major Projects Director
Delivery Manager	Head of Commercial Intelligence

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Savings KPI	Increasing efficiency makes achieving CPI more challenging.	Exact linkage is currently undefined.	No management is in place at this stage – through use of commercial intelligence

Keeping the Network in Good Condition

KPI: The percentage of pavement asset that does not require further investigation for possible maintenance

Narrative: The Network Pavement Condition reports on the pavement condition as a result of deterioration of the Strategic Road Network (SRN) due to time, traffic and maintenance. It shows the percentage of the SRN that needs no further investigation for possible maintenance, which is to be maintained at 95% or above. To achieve this, we will undertake a major programme of maintenance and renewal funded through the Investment Plan.

Definition: This measure reports on the overall SRN network condition as a result of deterioration of the pavement network due to time and traffic and restoration of condition from the annual investment in maintenance.

The measure provides the confidence that renewals maintenance is undertaken at the right time and in the right place, making best use of the available funds.

The levels of condition that are used to indicate when investigation is required and when there is an urgent potential need for maintenance are given in Design Standards in Volume 7 of the Design Manual for Roads and Bridges.

To report network condition, the most recent condition measurements (up to 2 years old) are combined with the definition of the network and records of pavement maintenance stored in HAPMS.

This is an established measure that has been used since 2004-05.

KEY DEFINITIONS

PAVEMENT ASSET - For the KPI, the pavement asset is lane 1 of main carriageway (ie not lay-bys, slip roads, link roads or roundabouts) on the network and excludes the part of the network managed as a part of a Design Build Finance and Operate (DBFO) concession.

Not require further investigation for possible maintenance: network condition surveys measure the condition of the pavement. If the condition breaks condition thresholds then further inspections and surveys are used to assess the need for maintenance. The KPI describes the part of the network that does not require any further investigation to establish the need for maintenance.

TRACS - Traffic speed Condition Surveys (measures the pavement surface condition), including measuring Rutting and Enhanced Longitudinal Profile Variance (ELPV)

Sideway-force Coefficient Routine Investigation Machine (measures the pavement skid resistance)

ELPV - The Enhanced Longitudinal Profile Variance value reflects the unevenness associated with profile features that are equal to or less in wavelength than the length of the filter used to calculate the Enhanced Longitudinal Profile Variance. For example, the variance of deviations from a 3m filter reflects the unevenness of profile features with wavelengths equal to or less than approximately 3m.

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	Percentage of the network (as defined by HAPMS, excluding DBFOs) requiring no further investigation to be maintained at 95% or above.
Measure of success	The percentage of the network not requiring further investigation for possible maintenance is at or above 95% in each year of the first Road Period.
Assumptions	• Achieving the target level of condition relies on levels of renewals maintenance funding remaining sufficient to adopt the current condition thresholds used to identify the need for maintenance. Network condition is represented by lane 1. If the condition of other lanes is to be included then the target would need to be modified. • It is assumed that the aspects of condition used to describe network condition and levels of condition used to describe Category 3 and Category 4 do not change. • Surveys to measure the aspects of condition used to describe network condition are carried out each year. It is assumed that this survey frequency is maintained. • It is assumed that there will be no significant change to the current network length (25,100 lane km) due to changes to the part of the network managed as DBFO concessions or transfers of road to/from local Authorities. DBFO roads are excluded from the network length as the condition is not affected by the Roads Renewals Maintenance programme to which the KPI relates. (Highways England has no direct control of what maintenance is carried out on DBFO roads). • Note: The measures described in the Design Manual for Roads and Bridges, Volume 7, in Design Standard HD28 [Skid Resistance] and Design Standard HD29 [Data for Pavement Assessment] are indicative of defects corrected via renewal schemes (and not routine maintenance) and only pertain to pavement defects.
Organisational dependencies	The reports on network condition are currently produced from the Highways Agency Pavement Management System (HAPMS) and will be produced from the new Integrated Asset Management Information System (IAM IS) when this becomes available.
Government targets	There is a related aspiration to resurface 80% of the surface of the pavement network by 2020/21. 80% of the current network length (all roads excluding those managed as DBFO concessions or transferred to/from local Authorities) is 23,262 lane km. This will support the achievement of the network condition target.
External influences	N/A

RISKS

Field	Notes
To meeting target	• If the level of funding for renewals maintenance is not as anticipated, then the target may be at risk
To reporting	• Surveys to measure the aspects of condition used to describe network condition are carried out each year. It is assumed this survey frequency is maintained. If network condition surveys are not continued at the current frequency the reliability of the network condition can be questioned. Condition data is considered too old for network reporting if it is more than 2 years since the survey. • Note that not all of the network can be surveyed each year. For example, lane closures for various reasons can be present at the time of survey and it is not economic to return to the site to survey the closed length. Current survey levels for TRACS and the Sideway-force Coefficient Routine Investigation Machines exceed 97% each year. There is a risk this percentage may decrease as a result of increased network occupancy due to the RIS investment. This may mean network level surveys may have to be deferred in parts. • If coverage of network condition surveys is reduced there is a risk that scaling the available condition measurements becomes too unreliable for use in the condition assessment. • There is a risk that IAM IS does not store the pavement condition in the same way as HAPMS and equivalent condition reports cannot be obtained. However, part of the move from HAPMS to IAM IS is to ensure the same data will be recorded and stored in both systems and it is anticipated that the data will be reported in the same way. If IAM IS does not become available HAPMS will continue. If surveys cannot be loaded into IAM IS as soon as it becomes available, or there is a problem loading data into HAPMS at any time, the KPI will still use data up to two years old and so can still be reported. • There is a risk that IAM IS does not become available and HAPMS is not kept up to date to enable the production of network condition reports. However, the time allowed for recording the data onto the system is part of the service provider's contract and the procedures for recording the data are described in the agreed service provider Quality Plan. The service provider works to the Quality Plan and Highways England will check that this is done (the Highways Agency used to make these checks). • There is a risk that records of pavement maintenance are not kept up to date and the true level of condition cannot be reported, however, there is greater confidence that recent data is more accurate than historic data. Additionally, the service provider's contract includes procedures as detailed in the service provider Quality Plan, which are checked as detailed in the risk above, to encourage the

Field	Notes
	submission of good data. With regard to maintenance data only maintenance records with a date laid after the survey date will have any effect on the KPI.

METHODOLOGY

Field	Notes
Unit of measure	Percentage of the network.
Type of data	Percentage of pavement asset that does not require further investigation for possible maintenance. Road surface condition information is obtained through annual road surveys of lane 1 of main carriageways of non-DBFO parts of the SRN (The percentage of the network that is not DBFO is 84.2% measured as of 31st December 2014). The following measures of condition are used to describe the condition of each 10m length of lane 1: TRACS (Traffic Speed Condition Surveys), where a vehicle travelling with the traffic flow gathers data on surface condition • Rutting • Enhanced Longitudinal Profile Variance (ELPV) for wavelengths up to 3m • Enhanced Longitudinal Profile Variance (ELPV) for wavelengths up to 10m • Enhanced Longitudinal Profile Variance (ELPV) for wavelengths up to 30m Sideway force Coefficient Routine Investigation Machine surveys of skidding resistance • Sideway-force Coefficient Routine Investigation Machine Deficiency = Measured Sideway-force Coefficient Routine Investigation Machine condition – Sideway-force Coefficient Routine Investigation Machine Investigatory level for the pavement length The condition measurements are held for each 10m length of the network in the Highways Agency's Pavement Management System (HAPMS) and will be held in IAM IS in the future.
Geographical coverage	Each 10m length of lane 1 of main carriageways in the network maintained by Highways England (ie not lengths forming parts of Design Build Finance and Operate, DBFO, concessions).
Baseline period	2013-14
Baseline value	95.2%

<table>
<tr><th>Field</th><th>Notes</th></tr>
<tr><td>Historical data</td><td>The proposed measure has been used since 2004/5. Past data is noted below:
<table>
<tr><td></td><td>%</td></tr>
<tr><td>2011-12</td><td>95.6</td></tr>
<tr><td>2012-13</td><td>96.4</td></tr>
<tr><td>2013-14</td><td>95.2</td></tr>
</table></td></tr>
<tr><td rowspan="2">Methodology and calculation</td><td>Data collection:
The aim is for annual condition surveys of lane 1 of the network. Data is collected using TRACS and Sideway-force Coefficient Routine Investigation Machines.
As noted in risks to reporting, not all of the network can be surveyed each year. For example, lane closures for various reasons can be present at the time of survey and it is not economic to return to the site to survey the closed length. Current survey levels for TRACS and Sideway-force Coefficient Routine Investigation Machines exceed 97% each year.
Records of maintenance are entered into HAPMS / IAM IS when the maintenance has been completed (maintenance refers to replacement of the pavement surface as part of the annual Roads Renewals Maintenance programme).
The time delay after completion of maintenance and the coverage recorded vary between service providers. Recording of maintenance is part of the Managing Agents duties and is described in the Quality Plan for each Agent. The Agent works to the Quality Plan but no checks are undertaken by Highways England to verify all maintenance records have been entered.</td></tr>
<tr><td>Calculating the metric:
Network condition is described by the condition of each 10m length of lane 1 of main carriageways in the network maintained by Highways England (ie not lengths forming parts of Design Build Finance and Operate, DBFO, concessions).
The aspects of pavement condition used to report network condition are rutting, longitudinal profile, skid resistance.
The UK Design Manual for Roads and Bridges (DMRB) standards HD28 and HD29 define road conditions measured by network condition surveys. The target condition (Category 3a) is mid-way between 3 and 4:
Category 1 – No visible deterioration
Category 2 – Low level deterioration & no action required
Category 3 - Moderate level of deterioration and investigation is required
Category 4 - Severe level of deterioration and intervention is required.</td></tr>
</table>

<table>
<tr><th>Field</th><th>Notes</th></tr>
<tr><td></td><td>
The target condition is the percentage of the network assessed to have condition as good as or better than Category 3a.
For the assessment of maintenance options, the condition associated with the preferred ‘Do Something’ option that is based on engineering standards, is likely to be between Categories 3 and 4.

A 10m section of road is deemed to be a category 3a if any of the following thresholds are exceeded:

Condition Parameter thresholds

<table>
<tr><th>Condition Parameter</th><th>Category 3a</th></tr>
<tr><td>Rut depth (mm)</td><td>15.5</td></tr>
<tr><td>Ride Quality – 3m Longitudinal Profile Variance (mm^2)
Motorways
Rural Dual Carriageways
Urban Dual Carriageways
Rural Single Carriageways
Urban Single Carriageways</td><td>

3.3
3.3
3.85
3.85
6.55</td></tr>
<tr><td>Ride Quality – 10m Longitudinal Profile Variance (mm^2)
Motorways
Rural Dual Carriageways
Urban Dual Carriageways
Rural Single Carriageways
Urban Single Carriageways</td><td>

10.6
10.6
15.7
15.7
27.45</td></tr>
</table>
</td></tr>
</table>

Field	Notes

Ride Quality – 30m Longitudinal Profile Variance (mm^2)	
Motorways	88
Rural Dual Carriageways	88
Urban Dual Carriageways	98
Rural Single Carriageways	98
Urban Single Carriageways	145
Characteristic Skid Resistance (CSC)	IL – 0.05

IL = Investigatory Level

Note that network condition is the latest measured condition but the measurements are not used if the pavement surface has been maintained since the survey was undertaken. This section of pavement will be assessed in the next round of surveys If the pavement length has been resurfaced since the condition survey, the length is assumed to be in good condition (ie not a category 3a) for the calculation of the KPI.

Example (Illustrative)
The network condition is based on survey information based on Lane 1.
The example shows the length in good condition scaled up for the proportion of the network with data (condition and maintenance records).
Total lane 1 length of the network = 7,500 miles
Total lane 1 length of the network with condition data = 7,350 miles
Total lane 1 length of network data not requiring further investigation (better than Category 3a condition) = 7,055 miles
Total lane 1 length of the network not requiring further investigation (better than Category 3a condition) =
= (7,055)/(7,350) x 7,500 = 7,199 miles
% of the network not requiring further investigation =
= (7,199)/(7,500) x 100 = 96%
The scaling of network condition for missing condition data is undertaken separately for each defect.
The annual report of network condition shows the condition of Lane 1, excluding the DBFO lengths in the network.

Field	Notes
Data collection frequency	The aim is for annual condition surveys of lane 1 of the network.
Validation/ cleansing	*Data collection:* All data quality checking/cleansing/filtering is undertaken as part of loading and accepting the data into the asset database. The Asset System Support Team (HAST for pavement data in HAPMS) checks all surveys are loaded for the roads surveyed (using GPS data). The Support Team records that the checks have been carried out.
	Calculating the metric: No data quality checking/cleansing/filtering is undertaken on the data extracted from the asset system (HAPMS or IAM IS). However, the procedures are audited to ensure the right data in the system is extracted, and the final indicator value is sense checked against previous performance.
Data quality score	Data Quality Score of 2B is given The representativeness of the data is classed as 2: Lane 1 data is used, which is deemed representative of the other lanes. However, DBFO sections of road (15.8%) are not included in this measure, and slip and link roads, lay-bys and roundabouts are not included in the measure. The accuracy of the data is deemed as a 1. As such, the validity score is 2. The reliability of the data is classed as B, as the process involves a contractor manually extracting data from HAPMS to create the KPI.

REPORTING

Field	Notes
Highways England reporting	The condition report is calculated each month (for internal management purposes) based on snapshots of data from HAPMS (and IAM IS in the future). An annual report summarises the change in condition through the year. The monthly network condition reports are produced within approx. 5 working days of the start of the following month.
Outside scope of assessment	• Parts of the network managed by Design Build Finance and Operate (DBFO) concessions are out of scope of this metric. The percentage of Lane 1 Length that is not DBFO is 84.2% measured as of 31st December 2014. Therefore the length of DBFO makes up 15.8% of the network.

Field	Notes
	• Each DBFO contract has the required pavement condition standard described in the contract and this is audited separately from the KPI assessment. • Parts of the SRN that do not form part of a main strategic route (eg slip and link roads, lay-bys and roundabouts) are out of scope of this metric. The percentage of total Lane 1 Length (excluding DBFOs) that is not main Carriageway is 17.3% % measured as of 31st December 2014. • Network condition is represented by lane 1 data only. • The metric may be altered in future to add further parameters, such as structural condition information, or improved surface condition measures. But this will not be included in the scope of measuring this metric.

APPROVAL PROCESS

Field	Notes
Accountable Director	Professional & Technical Solutions Director
Delivery Manager	Pavements Team Leader

KEY INTERDEPENDCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan KPI	Successful delivery of the investment plan should have a positive impact on pavement condition.	Exact linkage is currently undefined.	No management is in place at this stage.
Traffic PI	An increase in traffic levels may result in a decrease in pavement condition.	Exact linkage is currently undefined.	No management is in place at this stage.
Incidents PI	An increase in the number of incidents may result in a decrease in pavement condition.	Exact linkage is currently undefined.	No management is in place at this stage.

PI: Geotechnical Asset Inventory (Length) & Asset Condition (Feature Grade)

NARRATIVE: Performance Indicators relating to geotechnical assets consist of inventory and condition indicators. Inventory indicator is the length of the network (km) for which a geotechnical inspection survey has been completed. - Condition indicator is represented by a percentage (%) of geotechnical assets which are not Feature Grades 3, 4 or 5. These indicators are used for geotechnical assets within Highways England land on both sides of the carriageways but exclude DBFO managed routes except the M25 DBFO. The standard HD41/15, *Maintenance of highways geotechnical assets*, provides detailed guidance and the standards to be applied for the inspection and maintenance management of highways geotechnical assets. This is complimented by HD22/08, *Managing geotechnical risk*, which sets out the procedures to be used during the process of planning and reporting of geotechnical works carried out on Highways England highways.

KEY DEFINITIONS

GEOTECHNICAL ASSET INVENTORY –The characteristics of a geotechnical asset that are static over time, for example location, length, height, angle, materials etc." Inventory information is detailed in Annex C of HD41/15.

GEOTECHNICAL ASSET FEATURE GRADE - This is an index derived during geotechnical inspection of earthworks which provides an indication of the relative condition of the geotechnical asset at that point and is used for the subsequent input into risk-based assessments, including inspections and interventions. The Feature Grade is based on the Feature Class, reflecting the type/size of a geotechnical feature, and the Location Index, reflecting its proximity to the network and 3rd party assets. Details of the process to derive the Feature Grade are set out in HD41/15. The relationship between Feature Grades and recommended geotechnical interventions is set in Table 7-1, HD41/15 and reproduced below;

HD41 Feature Grade	Recommended Geotechnical intervention
5	Timely intervention to ensure safety should be undertaken. Remedial intervention should be programmed typically within one year. Assess inspection and monitoring requirements. Contingency planning required in preparation for any accelerated deterioration.
4	Remedial or preventative intervention should be programmed typically within 5 years. Assess inspection and monitoring requirements. Contingency planning required in preparation for any accelerated deterioration.
3	Remedial intervention not generally required within 5 years however remedial or preventative intervention may be programmed as part of other schemes.
2	Remedial intervention is not required, but preventative intervention may be required. Works do not need to be programmed and may be done as part of other schemes.
1	Remedial or preventative intervention is not required.

INSPECTION - examination of a geotechnical asset to record the characteristics of the asset, both in terms of inventory and condition. Details including the framework for inspection frequencies are set out in HD41/15.
GEOTECHNICAL ASSETS - A geotechnical asset is defined as the man-made or natural earthworks below the road pavement layers and the adjacent land beside the road. These comprise two types: Major Earthworks and Minor Earthworks.
MINOR EARTHWORKS - Are those assets whose maximum vertical height, within the longitudinal extent of the asset is less than 2.5m. Minor earthworks may comprise cuttings, embankments and at-grade sections.
MAJOR EARTHWORKS - Are assets having a maximum vertical height, within the longitudinal extent of the asset, greater than or equal to 2.5m. Major earthworks may comprise cuttings, embankments and bunds. Note – minor and major earthworks are treated the same way and included in both PIs.
HIGHWAYS ENGLAND GEOTECHNICAL ASSET INFORMATION SYSTEM: This is the system which holds geotechnical asset information, from which the Performance Indicators are obtained.
ITN NETWORK: The road network model managed by the Ordnance Survey; it is part of OS Mastermap suite of products.

ASSUMPTIONS FOR CALCULATING TARGET

	Geotechnical Asset Inventory (length)	Geotechnical Asset Condition (Feature Grade)
Field	**Notes**	
Target value	N/A	N/A
Measure of success	Sustaining or improving the Length of the network for which a geotechnical inspection has been completed.	Increase in the baseline percentage of geotechnical assets which are not Feature Grades 3, 4 or 5. Feature Grades 3, 4 or 5 represent areas where remedial intervention is required or recommended.
Assumptions	N/A	N/A
Organisational dependencies	Inventory data is produced and uploaded on to HAGDMS by Highways England employed designers for new major schemes and service providers for other works.	Condition data is produced and uploaded on to HAGDMS by Highways England service providers.
Government targets	N/A	N/A

	Geotechnical Asset Inventory (length)	Geotechnical Asset Condition (Feature Grade)
Field	**Notes**	
External influences	Third party schemes that affect the asset inventory are reported to the service providers, who then action the changes on HAGDMS. If DBFO inventories are added to this measure in the future, this may influence the indicator.	Third party schemes that affect asset conditions are reported to the service providers, who then action the changes on HAGDMS If DBFO asset conditions are added to this measure in the future, this may have an influence on the indicator.

RISKS

Field	Notes	
To meeting target / measure of success	Service providers do not upload inventory data for new or modified geotechnical assets. Inaccurate, incomplete or incorrect inventory data uploaded.	Service providers do not upload condition data for new or modified geotechnical assets. Inaccurate, incomplete or incorrect condition data uploaded.
To reporting	Service providers do not upload inventory data for new or modified earthworks. DBFO Cos do not capture the required information. Inaccurate, incomplete or incorrect data uploaded. The ITN network is not updated in a timely manner.	Service providers do not upload Feature Grade data. DBFO Cos do not capture the required information. Inaccurate information uploaded and approved. The ITN network is not updated in a timely manner.

METHODOLOGY

	Geotechnical Asset Inventory (length)	Geotechnical Asset Condition (Feature Grade)
Field	**Notes**	
Unit of measure	Length of the network (km) for which a geotechnical inspection has been completed.	Percentage (%) of geotechnical assets which are not Feature Grades 3, 4 or 5.
Type of data	Numeric data derived form start and end co-ordinates of assets mapped onto the centreline of the ITN network.	Numeric data derived form start and end co-ordinates of observations mapped onto the centreline of the ITN network.
Geographical coverage	SRN excluding network managed by DBFO Companies (except M25 DBFO). Also included are Highways England assets that extend onto 3rd party property e.g. other highway authorities.	SRN excluding network managed by DBFO Companies (except M25 DBFO). Also included are Highways England assets that extend onto 3rd party property e.g. other highway authorities.
Baseline period	November 2014.	July 2015.
Baseline value	12,986 km.	96.4%.
Historical data	Comprehensive data is available from 2010.	Comprehensive data is available from 2015.
Methodology and calculation	*Data collection:* Data is reviewed after collection and inputted into HAGDMS by our service providers.	*Data collection:* Data is reviewed after collection and inputted into HAGDMS by our service providers.
	Calculating the metric: The metric is extracted from HAGDMS: the sum of the lengths of geotechnical assets having an approval status "Preliminary" or "Approved". The length is derived by projecting start and finish co-ordinates onto the ITN centreline.	*Calculating the metric:* The metric is extracted from HAGDMS: the length of geotechnical assets, expressed as a percentage of the Geotechnical Asset Inventory length, which are not HD41/15 Feature Grade 3, 4 or 5 and where those observations have an approval status of "Preliminary" or "Approved".

	Geotechnical Asset Inventory (length)	Geotechnical Asset Condition (Feature Grade)
Field	**Notes**	
Data collection frequency	The data is captured mainly by Principal Inspections during the autumn and winter months. There will typically be little variation in the reported values in the spring and summer periods.	The data is captured mainly by Principal Inspections during the autumn and winter months. There will typically be little variation in the reported values in the spring and summer periods.
Validation/cleansing	*Data collection:* The relevant data is captured by service providers on site using GPS techniques. This is considered to be to an acceptable level of accuracy. The data is validated at point of data entry by software on a mobile device. The information is reviewed by a suitably competent person before being given the status of “Approved”.	*Data collection:* The relevant data is captured by service providers on site using GPS techniques. This is considered to be to an acceptable level of accuracy. The data is validated at point of data entry by software on a mobile device. The information is reviewed by a suitably competent person before being given the status of “Approved”.
	Calculating the metric: The metric is produced automatically from HAGDMS	*Calculating the metric:* The metric is produced automatically from HAGDMS

	Geotechnical Asset Inventory (length)	Geotechnical Asset Condition (Feature Grade)
Field	**Notes**	
Data quality score	2A The representativeness of the data is classed as 2, this is because some DBFO sections are not included in this metric. The accuracy of the information is classed as 1, as the data is 'regulated' at point of input (via electronic field capture devices). Data is initially entered as 'Preliminary' until validated by the suppliers' suitably qualified person. Data quality/visualisation tools are used by the Supplier for as part of this validation exercise. The same tools are periodically used by Highways England to independently check data quality. As such, the validity score is 2	2A The representativeness of the data is classed as 2, this is because some DBFO sections are not included in this metric. The accuracy of the information is classed as 2, as the data is 'regulated' at point of input (via electronic field capture devices). Data is initially entered as 'Preliminary' until validated by the suppliers' suitably qualified person. Data quality/visualisation tools are used by the Supplier for as part of this validation exercise. The same tools are periodically used by Highways England to independently check data quality. As such, the validity score is 2.

REPORTING

Field	Notes	
Highways England reporting	Quarterly	Quarterly
Outside scope of assessment	Geotechnical assets managed by DBFO Companies are not included except the M25 DBFO	Geotechnical assets managed by DBFO Companies are not included except the M25 DBFO

APPROVAL PROCESS

Field	Name	
Accountable Director	Safety, Engineering and Standards Director.	Safety, Engineering and Standards Director.
Delivery Manager	Geotechnical Advisor.	Geotechnical Advisor.

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Delivery Plan KPI.	Completing the Investment Plan will have a positive influence on geotechnical asset conditions.	Exact linkage is currently undefined.	Correct application of HD22 should ensure that against any scheme in the Investment Plan there is an assessment of the Geotechnical Assets and that any associated risks (inc. those associated with identified geotechnical features) are appropriately managed through the works undertaken.

PI: Drainage asset – inventory and condition data coverage

Narrative: We are required to provide a suite of PIs to give a better understanding of the condition of the (Strategic Road Network) SRN as a whole.
Definition: To monitor the coverage across the SRN of drainage asset inventory and condition data.
Drainage asset inventory data coverage is defined as: The network route length having at least one drainage asset inventory record within 100m, expressed as a percentage of the total network route length.
Drainage asset condition data coverage is defined as: Route coverage of drainage asset inventory data, factored by the proportion of the recorded continuous asset inventory that has condition data.

KEY DEFINITIONS
ROUTE COVERAGE OF THE INVENTORY - The length of route that contains any drainage assets.
Drainage assets are discrete component parts of the drainage network. These are broadly incorporated into the following groups: Chambers, gullies, inlets/outlets, ponds, pipes ditches/channels.
CONTINUOUS DRAINAGE ASSET - A linear drainage asset such as a pipe, channel or ditch, as defined by HD43/04. (DMRB 4.2) Drainage Data Management System for Highways.
POINT DRAINAGE ASSET - A drainage asset of limited extent such as a chamber, gully, outfall, flow control or a soakaway, as defined by HD43/04. (DMRB 4.2) Drainage Data Management System for Highways.
REGION DRAINAGE ASSET - A polygonal drainage asset such as a pond or infiltration basin, as defined by HD43/04. (DMRB 4.2) Drainage Data Management System for Highways.
CONDITION DATA - A drainage asset for which structural condition and/or service condition has been assessed or attempted to be assessed.
STRUCTURAL CONDITION - Relates to the fabric of each drainage asset and the severity of the structural defects that affect its integrity. Structural defects are addressed by repairing or replacing the asset.
SERVICE CONDITION - Relates to the water carrying capacity of the asset and the severity of the defects that reduce its capacity below its original design level, but is independent of the structural condition. Service defects are addressed by maintenance of the asset such as cleansing or vegetation clearance.
HADDMS - Highways Agency Drainage Data Management System– this is the database where all drainage data is held.

ASSUMPTIONS FOR CALCULATING TARGET

	Inventory data coverage	Condition data coverage
Field	**Notes**	
Target value	N/A	N/A
Measure of success	An increase in the percentage of the network with drainage inventory data recorded on HADDMS.	An increase in the percentage of the network with drainage condition data recorded on HADDMS.
Assumptions	Under current Asset Support Contract (ASC) contractual requirements service providers are required via the Asset Maintenance and Operating Requirements (AMOR) to record asset data as defined in the Provider contract and as set out in the Asset Data Management Manual (ADMM) Provider Requirements. Current delivery of this metric is based upon existing service providers fulfilling their current contractual requirements, having capacity to do so and the Agency maintaining HADDMS accordingly. Other things to note: Drainage assets more than 100m from a main carriageway are not taken into account when calculating the "route coverage of inventory data". These are included in the lengths of continuous asset. "Route coverage of inventory data" is counted provided at least one asset is recorded within the required proximity. It does not indicate whether all assets in that location have been recorded, or if all information is complete.	Under current Asset Support Contract (ASC) contractual requirements service providers are required via the Asset Maintenance and Operating Requirements (AMOR) to record asset data as defined in the Provider contract and as set out in the Asset Data Management Manual (ADMM) Provider Requirements. Current delivery of this metric is based upon existing service providers fulfilling their current contractual requirements, having capacity to do so and the Agency maintaining HADDMS accordingly. Other things to note: Condition information for point and region assets is not considered. This means that the percentage coverage is an approximation of the percentage of assets with condition data. If a service provider has only uploaded records of assets that have had a condition survey, then they may not have recorded other assets that have not been assessed. For example they have uploaded CCTV surveys of pipework, but not then added non-CCTV'd assets such as channels and ditches. In this case the "number of continuous assets recorded in inventory" may be lower than reality, which would artificially increase this metric.

	Inventory data coverage	Condition data coverage
Field	**Notes**	
Organisational dependencies	In addition to those outlined above under 'Assumptions', completion of data uploads at the end of any significant works on the network that introduce new / alter existing / confirm the position of existing drainage assets. This will include uploading all drainage data for all MP projects, and OD Local network Improvements (LMNS), Maintenance and renewals, and any other relevant works. DBFO operators providing information.	In addition to those outlined above under 'Assumptions', completion of data uploads at the end of any significant works on the network that introduce new / alter existing / confirm the condition of existing drainage assets. This will include uploading all drainage data for all MP projects and, OD Local network Improvements (LMNS) Maintenance and renewals, and any other relevant works. DBFO operators providing information.
Government targets	N/A	N/A
External influences	DMRB – any changes to relevant standards arising from changing legislation and/or best practice from within the Water Industry may result in additional inventory requirements.	DMRB – any changes to this may result in relevant standards arising from changing legislation and/or best practice from within the Water Industry may result in additional condition requirements. In particular changes in relation to water quality and flood risk could influence the metric.

RISKS

Field	Notes
To meeting target / measure of success	There is no target but success in progressing these PIs would be affected by: • Service providers do not upload data. • Service providers upload poor quality /duplicate data. • Service providers delete good data on HADDMS. • Drainage data is lost at contract handover.
To reporting	Reporting is currently automated but it would be affected if the service was to discontinue - maintenance of HADDMS Support desk reporting is crucial.

METHODOLOGY

	Inventory data coverage	Condition data coverage
Field	**Notes**	
Unit of measure	Percentage of the network with drainage inventory data.	Percentage of the network with drainage condition data.
Type of data	Percentage (provided by HADDMS)	Percentage (provided by HADDMS)
Geographical coverage	Entire SRN	Entire SRN
Baseline period	January 2015	January 2015
Baseline value	90% (as of the Monthly report 28.01.15)	23% (as of the Monthly report 28.01.15) By August 2015 we will agree with the Monitor a date by which sufficient drainage condition data will be available to enable a representative drainage condition indicator to be reported on.
Historical data	Data is available from May 2010 onwards	Data is available from May 2010 onwards
Methodology and calculation	*Data collection:* Data on the inventory and condition of the drainage asset is collected in various types of asset surveys as part of Major Projects, routine maintenance and Local Network Improvement Schemes (LNMS) and is periodically uploaded to HADDMS by the service providers.	*Data collection:* Data on the inventory and condition of the drainage asset is collected in various types of asset surveys as part of Major Projects, routine maintenance and Local Network Improvement Schemes (LNMS) and is periodically uploaded to HADDMS by the service providers.
	Calculating the metric: The "route coverage of inventory data" is calculated by: 1. All drainage asset locations are buffered by 100m. 2. The extent of main carriageway road sections underlying this buffer is determined. 3. Each side of a dual main carriageway	*Calculating the metric:* The route coverage of inventory data is multiplied by the proportion by length of continuous drainage assets with condition data. The length of continuous asset is measured along the individual drainage asset, in a horizontal direction. The drainage condition data coverage PI should be reported as a percentage to zero decimal places.

	Inventory data coverage	Condition data coverage
Field	**Notes**	
	contributes 50% of its length to the route length. Single main carriageways contribute 100% of their length. Slip roads and other non-main carriageways are ignored. The calculation used is Length of the SRN with drainage inventory data / Length of the SRN (x100) The drainage inventory data coverage PI should be reported as a percentage to zero decimal places.	
Data collection frequency	Ongoing – data is entered by the supply chain on a continuous basis when maintenance or improvement work is undertaken on the network.	Ongoing – data is entered by the supply chain on a continuous basis when maintenance or improvement work is undertaken on the network.
Validation/ cleansing	*Data collection:* All drainage survey data uploaded to HADDMS through a rigorous series of automated checks (detailed in the Drainage Data Formats guidance note issued August 2012 - available on HADDMS) before it is accepted onto the system.	*Data collection:* All drainage survey data uploaded to HADDMS through a rigorous series of automated checks (detailed in the Drainage Data Formats guidance note issued August 2012 - available on HADDMS) before it is accepted onto the system.
	Calculating the metric: The PI is calculated for all drainage asset data that satisfies the inclusion criteria (ie it only considers drainage assets within 100m of the carriageway centreline.) that is held on HADDMS at the time of calculation. The data having been previously validated as indicated above.	*Calculating the metric:* The PI is calculated for all drainage asset data that satisfies the inclusion criteria (detailed above) that is held on the HADDMS at the time of calculation. The data having been previously validated as indicated above.
Data quality score	3A The representativeness of the data is classed as 1 as the whole of the SRN is included for all assets. The accuracy of the data is classed as 4, as 36% of the inventory data is validated by field survey and as	2A The representativeness of the data is classed as 3 as the whole of the SRN is included, but the assessment is based on only the continuous assets which form 67% of the available condition data.

	Inventory data coverage	Condition data coverage
Field	**Notes**	
	a series of automated checks are done before the data is accepted onto the system. As such, the validity score is 3. The reliability of the data is classed as A, as the calculation process is fully automated, has been extensively checked and has been operational for over 5 years. Management are very satisfied with the process of calculating the final PI.	The accuracy of the data is classed as 1, as 100% of the condition data is validated by field survey and as a series of automated checks are done before the data is accepted onto the system. As such, the validity score is 2. The reliability of the data is classed as A, as the calculation process is fully automated, has been extensively checked and has been operational for over 5 years. Management are very satisfied with the process of calculating the final PI.

REPORTING

Field	Notes	
Highways England reporting	Calculating and reporting is automated into the HADDMS Monthly Drainage Report. Figures are calculated based on data as on DDMS on the 28th of the month, and are available to the HE within the first 10 days of the following month.	Calculating and reporting is automated into the HADDMS Monthly Drainage Report. Figures are calculated based on data as on DDMS on the 28th of the month, and are available to the HE within the first 10 days of the following month. Additionally, Highways England will regularly send to DfT and ORR the condition of the drains for which we have condition information to allow transparent reporting.
Outside scope of assessment	Any drainage assets not yet surveyed, inspected or validated. Any drainage asset inventory data held by the service providers but not yet uploaded onto HADDMS. Any drainage asset inventory data on HADDMS marked as superseded or archived.	Any drainage assets not yet surveyed, inspected or validated for condition. Any drainage asset condition data held by the service providers but not yet uploaded onto HADDMS. Any drainage asset condition data on HADDMS marked as superseded or archived. Condition of non-continuous drainage asset types.

APPROVAL PROCESS

Field	Name	
Accountable Director	Safety, Engineering and Standards Director	Safety, Engineering and Standards Director
Delivery Manager	Senior Drainage Engineer	Senior Drainage Engineer

KEY INTERDEPENDENCIES

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Flooding PI	Interventions to address flood hotspot locations will generate drainage surveys and inventory and condition data.	Exact linkage is currently undefined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanism ie OD, MPD will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.
Water Quality PI	Interventions to address flood hotspot locations will generate drainage surveys and inventory and condition data.	Exact linkage is currently undefined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Priority locations and key delivery mechanism ie OD, MPD will be identified and tracked through the development of the Environment Ring-Fenced Fund Plan and reporting processes.
Delivery Plan KPI	Delays in delivery of the first Road Period commitments could result in reduced opportunities to deliver improved network coverage of drainage inventory	Exact linkage is currently undefined – OD and MP forward programmes need to be reviewed but offer significant opportunity to improve inventory & condition data eg c1300 new lane km and 21, 000 km of new pipe	Through new data uploaded onto HADDMS as business as usual through delivery of network improvements

	and condition data.	present significant opportunity for improved drainage data.	
Pavement KPI	Delays in delivery of programme could result in reduced opportunities to deliver mitigation of identified priority locations through associated fence to fence initiative.	Exact linkage is currently undefined – OD and MP forward programmes need to be reviewed against known priorities. This activity is ongoing.	Extending maintenance/essential works to beyond other activities as part of resurfacing regime ie via fence to fence and new VM procedures currently under development.

PI: Technology Asset Availability

Narrative: Highways England possess a wide range of technology that is used to operate and manage the Strategic Road Network (SRN). The scope of technology assets consist of:

- The majority of roadside devices.
- Suite of control systems that operate those devices located in seven Regional Control Centres and one National Traffic Operations Centre.
- Communication network providing connectivity across the devices and control systems.
- Spares stock used for maintaining the technology assets.

All the above technology areas are reliant on each other and are a key asset for the Operations directorate (OD) for operating the SRN effectively and efficiently. Unlike civil infrastructure assets that are measured by their overall condition, the technology performance is measured by its overall availability to users.

Definition: Technology Availability – this is the percentage of the technology which is functioning correctly. The measure represents overall availability of technology assets used for management and operation of the SRN.

Due to the varied nature of technology used, the way the availability is calculated for each type of technology varies to demonstrate as accurately as possible the impact of service affecting issues to the users of the assets.

KEY DEFINITIONS

TECHNOLOGY - Technology in this context refers to Control Centre Technology; National Road Telecommunications Service (NRTS), Communication network assets; Roadside Technology; and Technology Spares.

TPMS - This stands for Technology Performance Management System, which is used for technology asset management and performance reporting across the SRN.

HALOGEN - Highways Agency Logging Environment, which is used for logging of system and device activity across a number of different types of technologies.

DMRB - Design Manual for Roads and Bridges – the key asset specification document.

ASSUMPTIONS FOR CALCULATING TARGET

	Technology Inventory	Technology Availability
Field	**Notes**	
Target value	N/A	N/A
Measure of success	N/A	Maintaining or improving from the baseline.
Assumptions	N/A	• Roadside Technology assets that are unavailable due to ongoing scheme works can be deducted from the overall availability figure. • Technology availability measures only relate to technology assets that have been commissioned and are under standard maintenance arrangements. • Planned maintenance is included to the availability figures eg any planned maintenance will have an impact on the availability figures. • Faults less than 15 minutes (ie fault clears itself) of duration are not affecting the availability performance. • Faults outside of the control of the contracted service provider do not affect PIs.
Organisational dependencies	N/A	• Dependent on Operations directorate (OD) Asset Maintenance Contractors completing their obligations for maintaining the assets. • Data accuracy is dependent on scheme delivery partners and asset maintenance contractors providing new asset data in a timely and accurate manner. • New asset data accuracy is dependent on the accuracy of scheme asset reports. • Speed of corrective works on the network is highly dependent on access to affected technology asset, which is coordinated by a third party. • Dependent on continuity of asset performance availability services, and maintenance services provided by third party

	Technology Inventory	Technology Availability
Field	**Notes**	
		providers.
Government targets	N/A	N/A
External influences	DMRB Maintainers Suppliers Scheme Contractors	DMRB Maintainers Suppliers Scheme Contractors

RISKS

Field	**Notes**	
To meeting target / measure of success	Improving inventory is dependent on OD and the supply chain carrying out routine inspections, and updating TPMS timely and accurately.	Improving availability is dependent on OD and the supply chain carrying out routine maintenance on technology, and updating TPMS effectively. Assets that have not been brought under the standard asset availability management process have reduced accuracy due to alternate methods used or information cannot be provided at all for those assets. Technology availability does not correlate with the contractual targets set for service providers, rather it measures the performance of the technology infrastructure itself.
To reporting	Reporting inventory is dependent on OD Regional contractors updating TPMS timely and accurately. Reporting on some technology types is held outside of the TPMS system, this is dependent on the responsible contractor or Highways England team providing timely and accurate availability data to the CSI team.	Reporting availability is dependent on OD updating TPMS effectively. Reporting of the PIs is dependent on continued operation of the TPMS system (or future replacement). Reporting on technology held outside of the TPMS system, is dependent on continued provision of availability data by the appropriate contractor or team.

METHODOLOGY

	Technology Inventory	Technology Availability
Field	**Notes**	
Unit of measure	Overall technology coverage of the SRN is not currently measured as part of a standard business reporting process.	Availability of the technology asset (%). The availability and performance of each technology asset type is measured by percentage of uptime (ie asset is available and working as intended) and by reducing the total minutes of down time that have occurred to each asset from the total potential uptime in the reporting month. Assets that have been marked by the maintenance contractors as “out of service” due to ongoing scheme works are discounted from calculations. Control systems performance is calculated very similarly, but faults that do not have degradation to the service are discounted from the overall figure.
Type of data	Equipment barcode, type, variant, manufacturer, installation date, status, location, asset maintainer.	Generic equipment types.
Geographical coverage	Entire SRN	Entire SRN, information have been separated to the corresponding regions.
Baseline period	N/A	Performance change is compared to previous reporting month and annual trends are captured and monitored as part of reporting process.
Baseline value	N/A	97-99.9 (dependant on asset)
Historical data	Source Data is available from 2011	Source Data is available from 2011
Methodology and calculation	*Data collection:* Asset Data is inputted into TPMS by our supply chain. Certain technology types exist outside of TPMS. The Asset data for these technologies is provided independently of TPMS by the managing contractor or relevant Highways England Team	*Data collection:* Asset data in TPMS is manually added by our supply chain. HALOGEN is an automated logging service. Manual submission of non-TPMS data is made directly to CSI team at end of reporting period. Availability data used is a combination of manual and automated data.

	Technology Inventory	Technology Availability
Field	**Notes**	
	responsible for the asset.	
	Calculating the metric: N/A	*Calculating the metric:* The technology availability metric is presented as three seperate availability scores of: • Control Centre Technology • NRTS Communications • Roadside Technology
Data collection frequency	Ongoing – data is entered by the supply chain on a continuous basis.	Continuous. Roadside device availability data is automatically captured from each asset at frequent intervals. The availability calculation is performed on a monthly basis.
Validation/ cleansing	*Data collection:* The data input onto TPMS by the supply chain is/is not checked or cleansed on a regular basis. Asset location data is validated by cross referencing with Halogen site data information, which provides us a higher confidence to accuracy of asset location and category.	*Data collection:* The data inputted onto TPMS by the supply chain is checked on a monthly basis but only in terms of percentage of field population. Currently there are no audits undertaken to validate content of the asset data fields.
	Calculating the metric: N/A	*Calculating the metric:* The final percentage is calculated semi-automatically from TPMS and is checked to see if there are any significant variances from previous months.

	Technology Inventory	Technology Availability
Field	**Notes**	
Data quality score	3C The representativeness of the data is classed as 2 (good). All bar one regional maintenance contract now has a contractual obligation to use TPMS. DBFO asset data is known not to be reliable as they do not have an obligation to use Highways England systems. Data accuracy has been scored as 3 (Average). The usage of an asset barcode system and cross referencing of asset data on two systems mitigates the majority of errors in asset numbers and locations. Accuracy of other asset data fields such as asset installation date and manufacture details are weaker as these fields are not proactively audited and rely on manual intervention. The data input onto TPMS by the supply chain is not checked or cleansed at regular basis. Reliability band has been assessed as C. Although some elements of the process are automated, there are still numerous manual interventions that reduce the overall reliability.	3C The representativeness of the data is classed as 2 (good). All bar one regional maintenance contract now has a contractual obligation to use TPMS. DBFO asset data is known not to be reliable as they do not have an obligation to use Highways England systems. The regional maintainers are able to discount assets out of availability calculations by manually changing the asset status to out of service when assets have been purposefully taken out of service (for example for scheme constructions). There is no standard process or method of validating the manual discounts. For control systems, the service issues that are deemed non-service affecting are discounted from availability calculations by manual process using agreed criteria. Data accuracy has been scored as 3 (Average). This is because availability data used is a combination of manual and automated data. Assets that have not been brought under the standard asset availability management process have reduced accuracy due to alternate methods used or information cannot be provided at all for those assets. Reliability band has been assessed as C. Although some elements of the process are automated, there are still numerous manual interventions that reduce the overall reliability. As part of the monthly reporting process the data is being queried and challenged but feedback cannot always be backed by empirical data to establish validity.

REPORTING

Field	Notes	
Highways England reporting	N/A	Monthly
Outside scope of assessment	N/A	Although the majority of technology assets are being reported in this manner, there are areas of technology that are not yet part of standard reporting processes. Key areas outside of scope currently are: • Severe Weather Information Service (SWIS) • Some DBFO control systems • Technology assets owned by contractors but used on the SRN • Smart Motorways • Spares availability.

APPROVAL PROCESS

Field	Name	
Accountable Director	Safety, Engineering and Standards Director	Safety, Engineering and Standards Director
Delivery Manager	Team Leader – Continuous Service Improvements, IT Directorate	Team Leader – Continuous Service Improvements, IT Directorate

KEY INTERDEPENDENCIES

The full list of KPIs/PIs has been reviewed. There are considered to be no key interdependencies which are likely to have a direct or significant impact on the performance of this indicator.

PI: Structure asset – inventory and condition

Narrative: We are required to provide a suite of PIs to demonstrate a better understanding of the condition of the Strategic Road Network (SRN) as a whole

Definition: The structures asset is split into two aspects; inventory and condition. This metric will help evaluate:

- Percentage of structures that have basic inventory information
- The condition of structures, using three indicators :
  - **Average Structural Condition (SCav):** This represents the average condition and can be used as a measure of demand for future expenditure on renewal works.
  - **Critical element condition (SCcrit):** This is a condition indicator that represents the critical elements. SCcrit will give an indication of the likelihood of having to close parts of the network, or restricting loading and traffic, in an unplanned manner to carry out repair and renewal.
  - **Structural Condition Index (SCI):** This represents an inspector's view of whether the structure is in good, fair or poor condition. As such it is a subjective measure and is used as a supporting indicator of condition.
- Please note that during Road Period 1, in line with the Requirements in the Performance Specification, we will be looking to improve asset information recording and quality, and investigating new condition indicators for structures

KEY DEFINITIONS

STRUCTURES - Comprising a range of over 19,000 individual assets including bridges, tunnels, retaining walls, culverts, gantries, masts and ancillary structures. This represents all of Highways England's structures assets.

SMIS - Structures Management Information System – this is the database where all structures data is held (this is expected to migrate to a structures module of an Integrated Asset Management Information System (IAM-IS), currently under development, by 2017). SMIS has been in place since 2002, and prior to that Highways England's predecessor organisations held structures data on a system called NATS (from the early 1980's).

INVENTORY - SMIS already holds inventory data on all its 19,000+ structural assets. This comprises basic reference information, which includes information about five different features of a structure: the location, age, size and form of the structures, , as well as the current load capacity of bridges. The current load capacity is the design capacity or assessed capacity, whichever is used to

manage the bridge. This basic information is supported by more detailed engineering information, about elements and components of the structure, as-built drawings, designer and manufacturer details, and materials used.

CONDITION - Condition is derived from inspections undertaken on all the structures assets. All of the19,000+ bridges and other structures on the SRN are inspected in line with the published guidance in the Design Manual for Roads and Bridges. This includes a general inspection every two years, and a more detailed principal inspection usually every six years, which identifies and records defects in reinforced concrete, steelwork and other construction materials. Where necessary further investigations and Special Inspections, which may include material tests, are undertaken to establish the extent, severity and specific causes of the defects. Where appropriate structural assessments are also undertaken to determine the load carrying capacity of bridges. Inspection and assessment information is also held on SMIS.

MAINTENANCE - Structural maintenance work is developed, based on needs derived from the inspection reporting of defects, understanding the cause of those defect and degradation mechanisms, structural assessment reports and environmental considerations. Where maintenance works are required, they are prioritised and subject to funding, the necessary repairs are carried out. Such maintenance actions when completed allow defects to be cleared from SMIS.

STRUCTURES HEALTHCHECK REPORTS - Reports run on a quarterly basis for each Maintenance Area to report a range of information including missing data for the benefit of Highways England staff and service providers managing structures assets.

DMRB - Design Manual for Roads and Bridges – the repository for all published standards relating to structures management.

ASSUMPTIONS FOR CALCULATING TARGET

	Inventory	Condition
Field	**Notes**	
Target value	N/A	N/A
Measure of success	An improvement in the completeness of inventory data that is held on the Highways England Structures Management Information System (SMIS), to assist asset and engineering management of the structures assets.	Improvement in the SCav condition score for the structure stock; Improvement in the SCcrit score for the structure stock; Improvement in the percentage of the structures stock with a SCI rating of 'good'.
Assumptions	That designers and service providers keep SMIS updated when new structures are built and provide all the data required in the format required by the system.	That service providers undertake inspections and update SMIS in a timely fashion to allow the data to be up to date.

	Inventory	Condition
Field	**Notes**	
Organisational dependencies	Inventory data is produced and uploaded on to SMIS by Highways England employed designers for new major schemes and service providers for other works.	Information provided by Highways England service providers
Government targets	N/A	N/A
External influences	DMRB – any changes to relevant standards may result in additional inventory requirements. Engineering needs, and learning lessons from worldwide failures, and from the experience of other bridge owners may also influence Highways England policy.	DMRB – any changes to relevant standards may result in changed inspection and reporting arrangements. New research may also influence requirements.

RISKS

Field	Notes	
To meeting target / measure of success	Designers do not upload inventory data for new structures. Service providers do not upload data for structures which have been maintained or modified. Inaccurate, incomplete or incorrect data uploaded.	Approximately 40% of Highways England's structures were built before 1980, and as such, there is a risk that the number of structures in need of intervention may increase more quickly than we can make interventions Service providers do not undertake inspections to meet agreed programmes. Service providers do not upload latest inspection reports to meet agreed programmes. Inaccurate, incomplete or incorrect data uploaded
To reporting	Collecting inventory data is dependent on supply chain updating SMIS promptly and effectively.	Collecting condition data is dependent on the supply chain updating SMIS promptly and effectively

METHODOLOGY

	Inventory	Condition
Field	**Notes**	
Unit of measure	% of structures, constructed and under construction, that have basic inventory information, split by: location, age, size, form, current load capacity and a total figure (Due to the difficulties in identifying the completeness and accuracy of the detailed engineering inventory this will not be reported, however apparent omissions of data are recorded in quarterly health-check reports provided to area teams and their service providers) A constructed structure is defined as having a Construction Status of either "Constructed" or "Constructed (Inspection Not Required)". The latter indicates that a structure does not require a structural inspection (e.g. an environmental barrier) and, therefore, has no inspections scheduled against it in SMIS. An under construction structure is defined as having a Construction Status of "Under Construction".	SCav score for the structures stock (scale 0-100) [Score of 80+ regarded as good or very good, 65-80 as fair, 40-65, poor, and 0-40 as very poor] SCcrit score for the structures stock (scale 0-100) [Score of 80+ regarded as good or very good, 65-80 as fair, 40-65, poor, and 0-40 as very poor] Percentage of the structures stock with a SCI rating of 'good'.
Type of data	High level inventory information as recorded on SMIS, for constructed and under construction structures, split by the following data fields: 1 Age — Count of no. of blank Construction Date entries	SCav & SCcrit: Condition scores for the structures based upon severity and extent of identified defects recorded on SMIS. SCI: Condition of the structures as determined by the inspector on site.

	Inventory		Condition
Field	Notes		
	2 Location	Count of no. of structures with blank OS Eastings or OS Northings entries	
	3 Bridge Size	Count of no. of Bridge and Large Culverts where the Overall Bridge Length is <= 0.1m	
	4 Bridge Form	Count of no. of Bridge and Large Culverts where the Overall Construction Type = "Not Known"	
	5 Retaining Wall Size	Count of no. of Retaining Walls where the (total) Retaining Wall Length is <= 0.1m	
	6 Retaining Wall Form	Count of no. of Retaining Walls where the Construction Type = "Not Known"	
	7 Small Span Structure Size	Count of no. of Small Span Structures where either the Length or Width is <= 0.1m	
	8 Small Span Structure Form	Count of no. of Small Span Structures where the Construction Type = "Not Known"	
	9 Sign Gantry Size	Count of no. of Sign Signal Gantries where either the Length is <= 0.1m	
	10 Sign Gantry Form	Count of no. of Sign Signal Gantries where the Construction Type = "Not Known"	
	11 Mast Size	Count of no. of Masts where either the Height is <= 0.1m	
	12 Mast Form	Count of no. of Masts where the Mast Type = "Not Known"	
	13 Mast Scheme Size	Count of no. of Mast Schemes where either the Mast Scheme Length is <= 0.1m	
	14 Mast Scheme Form	Count of no. of Mast Schemes where the Mast Scheme Type = "Not Known"	
	15 Tunnel Size	Count of no. of Road Tunnels where either the Tunnel Length is <= 0.1m	

	Inventory	Condition
Field	**Notes**	
	16 Tunnel Form — Count of no. of Road Tunnels where the Tunnel Type = "Not Known" 17 Load Management — Count of no. of Bridge and Large Culverts with "some" Load Management data (Signed Weight Restriction <> "Not Known")	
Geographical coverage	Entire SRN. Privately owned structures are not included in this measure.	Entire SRN apart from some DBFO companies (which are not obliged to use SMIS). Privately owned structures are not included in this measure.
Baseline period	31 May 2015	December 2014
Baseline value	Feature: % complete Age: 99.4% Location: 100% Size: 98.3% Structural Form: 98.1% Current Load Capacity: 85.7% Total: 97.7%	SCav (for stock) 84.1 SCcrit (for stock) 60.8 % of stock with SCI of 'good' 77.4%.
Historical data	Structures inventory information relates back to when a structure was built, and is constantly changing as new structures are added to SMIS, and other structures are demolished, detrunked or modified. Detailed engineering inventory data will change as components are replaced, or structures degrade. Data has been collected on SMIS as far back as 2004 initially, however data is commonly perceived to be more complete and robust from around 2010.	Collection of scored condition data began in 2008 and meaningful information can only be collected during a Principal Inspection (every 6 years). Approximately 80% of the stock now have this data and is representative of the whole stock. Historic data going back to 2011 is regarded as fairly representative of the overall stock. Inspector's condition rating of good, fair, or poor has been gathered prior to 2008 and is continued to be recorded.

	Inventory	Condition
Field	**Notes**	
Methodology and calculation	*Data collection:* Data is inputted into SMIS by our supply chain.	*Data collection:* Data is inputted into SMIS by our supply chain
	Calculating the metric: Data is extracted from SMIS by SMIS Technical Support, using *ad-hoc reports*. These data are then processed using a bespoke spreadsheet to produce this metric. More specifically, the number of "not known" entries for each data field is compared to the total number of entries in that data field, to give a percentage completeness figure for that field. The size and form feature scores are calculated by totalling the individual size data fields (items 3,5,7,9,11,13,15) and form data fields (items 4,6,8,10,12,14,16) detailed in the type of data field The total percentage score considers all the data fields	*Calculating the metric:* Structures are split into elements which have importance ratings from very high to low, depending on their importance to the functioning of the structure. During inspections defects are scored in terms of severity and extent against these elements. For the SCav measure the condition of elements across the structure are averaged, taking into account each element's importance, to give a score for the structure. A score for a group of structures, or the whole stock, is obtaining by averaging the individual structure scores with a weighting for structure size. The SCcrit score for a structure is the lowest defect score for an element of high or very high importance. A score for a group of structures, or the whole stock, is obtaining by averaging the individual structure scores with a weighting for structure size. This procedure is used by many bridge owners, such as local authorities, to calculate and report on condition of their stock of structures. The SCI condition scores, which reflect the inspectors' opinion of the state of the structure, are on a structure by structure basis and there is no weighting for structure size.

	Inventory	Condition
Field	**Notes**	
Data collection frequency	Ongoing – data is entered by the supply chain on a continuous basis. Note: Load Management data cannot be extracted by SMIS Technical Support. However, this data is produced every three months by Lockheed Martin	Ongoing – data is entered by the supply chain on a continuous basis
Validation/ cleansing	*Data collection:* SMIS Structures Healthcheck (SHC) Reports can be run showing where there is missing supporting inventory data. The SHC Reports highlight, among other things, data entries that have been set to "Not Known". The intent is that the supply chain will improve these data, for example, at the next Principal Inspection. The data inputted onto SMIS by the supply chain is not routinely checked, audited or cleansed.	*Data collection:* SMIS Structures Healthcheck (SHC) Reports can be run showing where there is missing condition data, where data would be expected. The intent is that the supply chain will improve the data, for example, at the next Principal Inspection. The data inputted onto SMIS by the supply chain is not routinely checked, audited or cleansed.
	Calculating the metric: Validation of the final PI is not currently done.	*Calculating the metric:* SCav & SCcrit: The embedded algorithm for calculating the scores has been in use for several years. Any change to this would negate any direct comparison to results from earlier years. SCI: The good, fair, or poor rating of an inspector is not checked once the report has been loaded onto SMIS.
Data quality score	3B The representativeness of the data is classed as 2, as all 19,000 structures on SMIS are represented in the data, but some DBFO sections are not included in this data.	3B The representativeness of the data is classed as 2, as all 19,000 structures on SMIS are represented in the data, but some DBFO sections are not included in this

	Inventory	Condition
Field	**Notes**	
	The accuracy of the data is classed as 3, as there are known problems with the supply chain updating structure records on SMIS, in sufficient time. As such, the validity score is 3. The reliability of the data is classed as B, as the metric is produced automatically from SMIS and management are content with the process.	data. The accuracy of the data is classed as 3, as there are known problems with the supply chain updating structure records on SMIS, in sufficient time. As such, the validity score is 3. The reliability of the data is classed as B, as the metric is produced automatically from SMIS and management are content with the process.

REPORTING

Field	Notes	
Highways England reporting	Yearly (Highways England to submit an annual report).	Report annually on the SCav, SCcrit and SCI
Outside scope of assessment	Privately owned structures are not included in this measure.	Privately owned structures, and those that are on DBFO routes which do not use SMIS, are not included in this measure.

APPROVAL PROCESS

Field	Name	
Accountable director	Safety, Engineering and Standards Director	Safety, Engineering and Standards Director
Delivery manager	Safety, Engineering and Standards Structures Policy	Safety, Engineering and Standards Structures Policy

KEY INTERDEPENDENCIES

4. Performance Specification - Requirements

The table below lists the Requirements detailed in the Performance Specification. Many of these provide additional context on the delivery of KPIs and PIs and will require Highways England to provide commentary and evidence on how it is working to meet the aims of the Performance Specification. Some require the production of reports or plans related to strategic or specific areas of Highways England's activities that will demonstrate how it is working to meet the aims of wider Government objectives or to deliver specific measures.

A number of others require Highways England to develop additional KPIs and PIs for the next Road Period. These will be developed and agreed with the DfT and ORR. The Requirements will feature in the Highways England Delivery Plan, or Highways England's internal Management Plans.

Performance Specification Area	Requirement	Requirement Contact	Accountable Director
Improving User Satisfaction	Demonstrate what activities have been undertaken, and how effective they have been, to maintain and improve user satisfaction.	Head of Customer Experience	Communications Director
	Support the Watchdog as it develops replacements for the NRUSS.	Highways England Watchdog lead	Communications Director
Supporting the smooth flow of traffic	Report annually on how Highways England has minimised inconvenience to road users through roadworks over the previous year.	Group Leader Asset & Operational Development	Safety, Engineering and Standards Director
	Demonstrate that Highways England is working effectively with its partners to improve incident response.	Head of Service Innovation	Operations Director

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Performance Specification Area	Requirement	Requirement Contact	Accountable Director
Encouraging economic growth	Highways England should report on average delay.	Performance Analysis Unit Team Leader	Strategy & Planning Director
	Actively support the Construction 2025 goals.	Procurement Divisional Director	Commercial & Procurement Director
	Deliver the Roads Academy programme across the industry.	Learning Specialist	Human Resources Director
	Develop Highways England's approach to innovation, technology, and research and agree an implementation plan by 31 March 2016.	Research & International	Safety, Engineering and Standards Director
	Through Route Strategies identify constraints to economic growth that the performance of the SRN could help to alleviate and identify how future delivery and investment plans might address them.	Team Leader, Road Investment Strategy	Strategy & Planning Director
Delivering better environmental outcomes	Demonstrate what activities have been undertaken, and how effective they have been, to improve environmental outcomes.	South and East Team Leader / Environment	Safety, Engineering and Standards Director
	Highways England should develop metrics covering broader environmental performance. These should include: ● A new or improved biodiversity metric; and ● Carbon dioxide, and other greenhouse gas emissions arising from the use of the network.	(Broader environmental performance) South and East Team Leader / Environment	Safety, Engineering and Standards Director
		(Biodiversity) Midlands and West Team Leader & Ecological Advisor	
		(Carbon) Sustainable development and design	

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Performance Specification Area	Requirement	Requirement Contact	Accountable Director
Helping cyclists, walkers, and other vulnerable users of the network	Report annually on the number of new and upgraded crossings.	Safety, Engineering and Standards Safer Roads Group Manager	Safety, Engineering and Standards Director
	New indicators which demonstrate improved facilities for cyclists, walkers, and other vulnerable users.		
	Report on how Highways England is delivering against the Public Sector Equality Duty.	Diversity Manager	
Achieving real efficiency	Demonstrate on an annual basis how efficiencies have been achieved.	Finance Divisional Director	Commercial & Procurement Director
Keeping the network in good condition	Produce an implementation plan, by 31 March 2016, to show how Highways England will improve asset information quality over RP1.	Asset Information Excellence Team Leader	Safety, Engineering and Standards Director
	Develop new condition indicators for Pavements and Structures for agreement by 31 March 2017 and complete validation for these by 31 March 2019.		
	Develop new condition indicators for Technology, Drainage, and Geotechnical Works for agreement by 31 March 2018 and complete validation for these by 31 March 2020.		

5. Governance and Reporting Arrangements

Reporting on the Performance Specification within Highways England will be part of the internal monthly management and reporting process. Unless agreed otherwise it is therefore expected that progress reports, exceptions and other relevant issues are reported internally in line with the monthly schedule. Specific guidelines on dates and formats for returns, and any check and challenge process, will be issued and managed by the appropriate team(s) in Highways England. While there may be local arrangements made within delivery teams or areas to ensure accuracy, completeness and timeliness of returns it is expected that the Delivery Manager and Accountable Director will sign off each submission.

The ORR will undertake a quarterly review of Highways England's performance. If there are any areas of significant variance from programmed performance and / or delivery be it either under or outperformance, the ORR may seek further information to understand the reasons behind the performance.

The primary basis for the ORR to assess the performance of Highways England will be through the annual monitoring reporting statements for each 12 month period ending 31 March. The review and, where appropriate, challenge of this annual return will enable the ORR to:

- monitor and report on the Performance Specification, Investment Plan and aspects of the licence,
- monitor and report on action plans that Highways England is already formulating to tackle areas needing improvement,
- identify and escalate new issues,
- undertake enforcement, through improvement notices and fines; and,
- provide information to the Secretary of State on the development of the next RIS.

Full details of how the ORR expects the reporting process to be undertaken, including the expectations for internal governance and sign off within Highways England can be found in the ORR's Monitoring Reporting Guidelines document.

The ORR will publish its assessment of Highways England's performance through an annual report, which will review the operational performance, financial performance and efficiency of Highways England during the financial year and cumulatively for the Road Period to date, as informed by Highways England's Annual Monitoring Return.

6. Document Control

Once finalised, any changes to the OMM will need to be agreed by Highways England and the DfT, and approved by senior officers in each organisation.

The change process will require the proposing party to set out what change is required and why, using the change control pro-forma which can be found at Annex B at the end of this manual. These changes exclude changes to the wording of any of the KPIs, PIs, requirements and other obligations as specified within the Performance Specification, which will be subject to a separate change process as described in the operating license and associated documents.

The completed pro-forma should be sent to OperationalMetricsManual@highwaysengland.co.uk where it will be progressed with the relevant parties within the two organisations. Where all parties are in agreement the change will be made according to the agreed timescale and version control applied. Where there is disagreement over any element of a change proposal a meeting should be arranged between the above named senior officers to seek agreement.

7. Related Documents and Useful reading

The OMM sits within a wider suite of documents that allows Highways England, DfT and the ORR to assess Highways England's performance. Useful documents which should be considered alongside the OMM are:

DfT

- Infrastructure Act 2015:
  http://services.parliament.uk/bills/2014-15/infrastructure.html
- Road Investment Strategy:
  https://www.gov.uk/government/collections/road-investment-strategy
- Licence:
  https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/431389/strategic-highways-licence.pdf

Highways England

- Strategic Business Plan:
  https://www.gov.uk/government/publications/highways-england-strategic-business-plan-2015-to-2020

- Delivery Plan 2015 – 2020
  https://www.gov.uk/government/publications/highways-england-delivery-plan-2015-2020

- Delivery Plan (Update) 2016 – 2017
  https://www.gov.uk/government/publications/highways-england-delivery-plan-2016-to-2017

- Delivery Plan (Update) 2017 – 2018
  https://www.gov.uk/government/publications/highways-england-delivery-plan-2017-to-2018

- Delivery Plan (Update) 2018 – 2019

https://www.gov.uk/government/publications/highways-england-delivery-plan-update-2018-to-2019

ANNEX A - Example KPI/PI Template with advisory text

KPI/PI: Name from Performance Specification or SBP
Narrative: Directly from Performance Specification or SBP
Definition: Brief definition of metric
KEY DEFINITIONS
Please define any key words that are contained within the title wording of the KPI and PI. Definitions need to be specific and clear in order that the ORR are able to understand the situation and context. For example words like 'Mitigate', 'Incident', and 'Noise Important Area' need to be defined and explained in the context they are used – what do these terms mean in the business context in relation to any actions/interventions proposed?
Eg how will a 'mitigation' be identified and recorded as such? How do we define an 'incident' in road safety terms? What is not in scope when defining an incident? How do we define a 'culvert/flooding hotspot'?
Additionally, where appropriate please also expand and define any acronyms, systems and other technical terms in this space
When considering definitions ask yourself: could Highways England be challenged on the definition?

ASSUMPTIONS FOR CALCULATING TARGET

Field	Notes
Target value	Value of target The Performance Specification 2015-2020 notes that it will be for Highways England to determine whether to apply targets to any PIs.
Measure of success	How the metric can be used to measure success Please state how the performance of this KPI/PI will show if we have been successful in this area. (Note, that if there is a target value (ie for the KPIs), then the measure of success is most likely to be "achieve or exceed the target", for PIs the measure of success is likely to be eg a reduction in the measure compared to the baseline value).
Assumptions	Please detail ALL short, medium and long term assumptions, and possible implications. It is really important to set these out to the ORR so that they can better understand the KPI / PIs as they are new to our business environment. The assumptions can cover any aspect of the target or measure of success, eg change in data source, speed

Field	Notes
	limits not changing, extreme weather (what constitutes extreme weather as something simple will not stand when questioned by ORR). This is our opportunity to communicate anything that might inform thinking and discussions with the ORR should we over or under achieve on a target.
Organisational dependencies	Please detail where there is inter divisional dependencies or dependencies on certain events that can influence achieving target or the measure of success, and state the level of dependency of that influence (quantify where possible, or if not add a statement to show the strength of the dependency) Eg1 Noise performance is strongly dependent on OD delivering the complete resurfacing programme to schedule. If 80% of the network is resurfaced we are very confident of meeting the target value. The minimum amount of resurfacing needed to meet the target is estimated at 50%. Eg2 Performance of the Accident Frequency Rate indicator has a weak dependency on Directorates promoting health and safety in the workplace.
Government targets	Note here any related government targets which might be influencing the KPI / PI.
External influences	Please consider possible influences on performance outside Highways England's control, eg legislative changes. Please explain what these are, and also: - How likely these are to have an influence (probability of occurring). - Quantify, or add a statement to show the strength of the influence that this external factor may have on performance. Eg Changes to the Water Quality Act may influence our ability to mitigate problem areas.

RISKS

Field	Notes
To meeting target / measure of success	What are the risks to being able to meet the target or the measure of success (eg increase in investment, reliance on other stakeholders). Also include any mitigation proposed for these risks.
To reporting	What are the risks to ensuring successful reporting of the metric (eg data collection issues, third party involvement). Also include any mitigation proposed for these risks.

METHODOLOGY

Field	Notes
Unit of measure	The measure used for the metric. For non-data based metrics, report on what will be presented Where appropriate, please include the period (month, day and time) used to calculate the metric. Eg monthly data, for Tuesday to Thursday, and 0800 – 1000 and 1600 – 1800 only.
Type of data	Please detail the name, source of data and supplier if third party to be used. Eg MIDAS and loop detectors on motorways only.
Geographical coverage	Please detail the spatial coverage of the metric. Eg entire SRN or motorways only. Also include any limitations of the coverage and if that impacts on us achieving the KPI / PI. Please include any exclusions eg if DBFO is not included.
Baseline period	Time period to be used for baseline metric. This is likely to be 13/14 (April 13 – March 14) performance, unless there is a valid reason for another baseline period. Please note: For the final OMM, we will include the 14/15 (April 14 – March 15).
Baseline value	Metric value – this is the performance for the baseline period above Please also state any significant influences/assumptions which have influenced this value. This may include any unusual circumstances that may skew the baseline (eg high traffic levels in this baseline period, unusually high levels of rain, unusually high levels of roadworks).
Historical data	If historical data exists and has been used to calculate this metric in the past using the same methodology as stated in this note, then please state the start date of when reliable data exists. Please include annual data (in tabular form) for the last five years (ie from April 2009 – April 2014), and comment on any significant variances, detailing what the causes of these variances were.
Methodology and calculation	Detail the method of *data collection*
	Formula or method of *calculating the metric*. Define, in detail, how the raw data is processed and transformed into the KPI/PI. Eg what elements are automated, and what elements are done manually? Is any data infilling done?
Data collection frequency	When is the raw data collected or provided to us.

Field	Notes
Validation/cleansing	*Data collection* Define in detail what data checking/cleansing/filtering/etc. methods are used, and when are they used. Please explain strengths/limitations of data including third party data Please ensure this section is explained in as much detail as possible ie how and when is the validation/checking undertaken? Eg For employee safety stats, how are employee hours checked/validated as being accurate? How often are these checks done? How do we know the checks have been done?
	Calculating the metric Define in detail how the data is transformed into the KPI/PI. Please explain any checking/cleansing/filtering/etc. methods used in calculating the metric, and when are they used. Please ensure this section is explained in as much detail as possible ie how and when is the validation/checking undertaken? Eg Once the metric is calculated, what checking is done to validate the calculation is correct? How often are these checks done? How do we know the checks have been done?
Data quality score	Please see methodology document titled "……." attached to the email and provide a scoring assessment of the data that is used to determine the KPI / PI, complete with a detailed commentary of why the score has been chosen. If more than one significant data set is used then please score each individually and detail what the dataset is. I haven't addressed this yet – To be confirmed at meeting today Eg Data Quality Score: A2 Eg commentary: We believe the accuracy of the data is classed as 2, because……. We believe the reliability of the data is classed as A, because…….

REPORTING

Field	Notes
Highways England reporting	Organisational reporting timelines – please note if there is a time lag in reporting up to date data eg is reporting one month in arrears?
ORR reporting	ORR reporting timelines will be detailed here as and when they become clear.

Field	Notes
requirements	
Outside scope of assessment	Areas where we should not be assessed if target/measure of success is being achieved.

APPROVAL PROCESS

Field	Name
Accountable director	
Delivery manager	

Key Interdependencies

Please note interdependent KPI/PIs in the table below, also noting:

- How a change (eg an increase) in the performance of any of the other KPI/PIs influences this indicator.
- A commentary how the metrics are linked, to what extent they are linked, and how these links are managed.
- See an example below which considers the PI: number of incidents on motorways.

KPI/PI name	How does an increase in the performance of this KPI/PI impact on this indicator	To what extent are they linked (the magnitude/quantum of the link)	How any links are managed
Traffic PI	An increase in traffic levels may result in an incident numbers.	Recent data shows that for every 100,000 cars on the network, incidents increase 1%	No management is in place.

ANNEX B - Change Request Form

The form below should be used to request any material or immaterial changes to the content of the OMM. Please email OperationalMetricsManual@HighwaysEngland.co.uk to obtain a copy of the form. All changes sought must follow this process. Potential changes could be such things as a result of error correction, change in knowledge or process, assumptions and other influencing factors, or any other element of the content of the KPI and PI templates or text contained in other sections that requires changing.

This form cannot be used to change the wording of any KPI or PI as specified within the Performance Specification. Any requirement to change these can be addressed through the change control process identified between the Department for Transport and Highways England to formally change the Performance Specification.

Operational Metrics Manual: Change Request Form

OMM Change Request				Change Request Number*
	Date Amended:	DD/MM/YYYY	Version 1.0	TBC

Change Request Title	*E.G. Material Changes to the Operational Metrics Manual – KPI2 Road User Satisfaction*		
Change Requestor	*Delivery Manager* Highways England	**Change Type**	RIS Change
Date of Change Request	*Month YYYY*	**Decision required by**	*Month YYYY*
SHARE link to HE tracked change technical note:	*http://*		
Material or Immaterial Change?	*Material / Immaterial*		

Change Description (Summary of key changes)

Provide a short summary of the metric, what is measures and how.
Summarise the key changes, numbering the different changes.
Will this change impact on any wider business projects, products or processes.

Or does this change invalidate any decisions already made by the business eg decisions made based on this indicator prior to this change

Please also consider and include here any consultation with relevant stakeholders you have had regarding this proposed change.

Reasons for change and urgency

Give clear justification for each change, and justify the timeline behind each change. This should read like a full business case, and needs to be in some detail for major/material changes.

Engagement & Consultation prior to submission to DfT

Discuss internal/external engagement as appropriate on deciding on the changes to take place. Discuss whether bodies such as Transport Focus have been engaged.

Recommendation to the Change Control Review Group / Change Control Decision Committee

<To be set out by the OMM Manager.>

OMM Sections Affected

Metrics Changed	Delivery Manager	Description of Change Required
The Metric section being affected EG PI – Acceptable Journeys	*Joe Bloggs, Directorate*	*Short summary of changes discussed above for the respective section.*

Customer Impact – is there likely to be a customer impact? (Yes)

These changes will have required an impact assessment – externally, who is going to be affected by the changes and to what extent.

Impact Analysis

Benefits and Business Case:

Will this change impact on any wider business projects, products or process eg major schemes, commitments in our RIS or delivery plan, PCF, value management, other decision making
Or does this change invalidate any decisions already made by the business eg decisions made based on this indicator prior to this change
Please also consider and include here any consultation with relevant stakeholders you have had regarding this proposed change.

Timescale:

State when each proposed change is set to take place with justification. Indicate the urgency of the change.

Costs:

If applicable. What is the cost of implementing this change? Eg do any reports or business processes need reworking, or new data sets need collecting?

Risks

Please note any risks that may arise as a result of the proposed changes, or that may occur in the process of making the proposed changes.

Approval required before submission:

Delivery Manager	Date
Name ***Role***	**01-Jan-17**
Accountable Director	Date
Name **Executive Director, *Directorate***	**01-Jan-17**

*Change Type
Immaterial changes
Inconsequential changes eg spelling errors, changes to text that don't impact on the functioning of the indicator
Material changes
Significant changes to methodology eg new data sources, new calculation approach, changes to the baseline, changes to SRN/regional definitions
Changes to the data quality score, significant changes to validation/cleansing techniques
Significant amendments to assumptions, risks, external influences, organisational dependencies

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If you have any enquiries about this publication email **info@highwaysengland.co.uk**
or call **0300 123 5000***. Please quote the Highways England publications code PR205/18

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Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363