AMEM Assessment
IIP Update Report

A report for the Office of Rail Regulation and Network Rail
from Asset Management Consulting Limited (AMCL)

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Compiled by: Andrew Sharp
Reviewed by: Martin Pilling
Authorised by: Richard Edwards

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Contents

Executive Summary

As the Independent Reporter for Asset Management, AMCL undertook an assessment of Network Rail's Asset Management capability maturity in mid-2011 and reported in December 2011[1] on the progress Network Rail had made since the previous assessment in 2009. This report contains the findings from an update to the 2011 assessment and evaluates the deliverables from Network Rail's Asset Management Improvement Programme (AMIP) that were not available at the time of the 2011 assessment but that were produced as part of the Initial Industry Plan (IIP) submission.

This update assessment was undertaken using the AMCL Asset Management Excellence Model™ (AMEM) and examined the extent to which the AMIP deliverables aligned with the AMCL Asset Management Improvement Roadmap[2] and the corresponding trajectory. This report now provides the complete assessment of Network Rail's Asset Management capability maturity at the point of the IIP submission and compares this to IIP target scores defined in the Roadmap. Diagram 1 shows the updated maturity scores alongside the Roadmap target scores for the IIP and the target scores for the end of Control Period 4 (CP4).
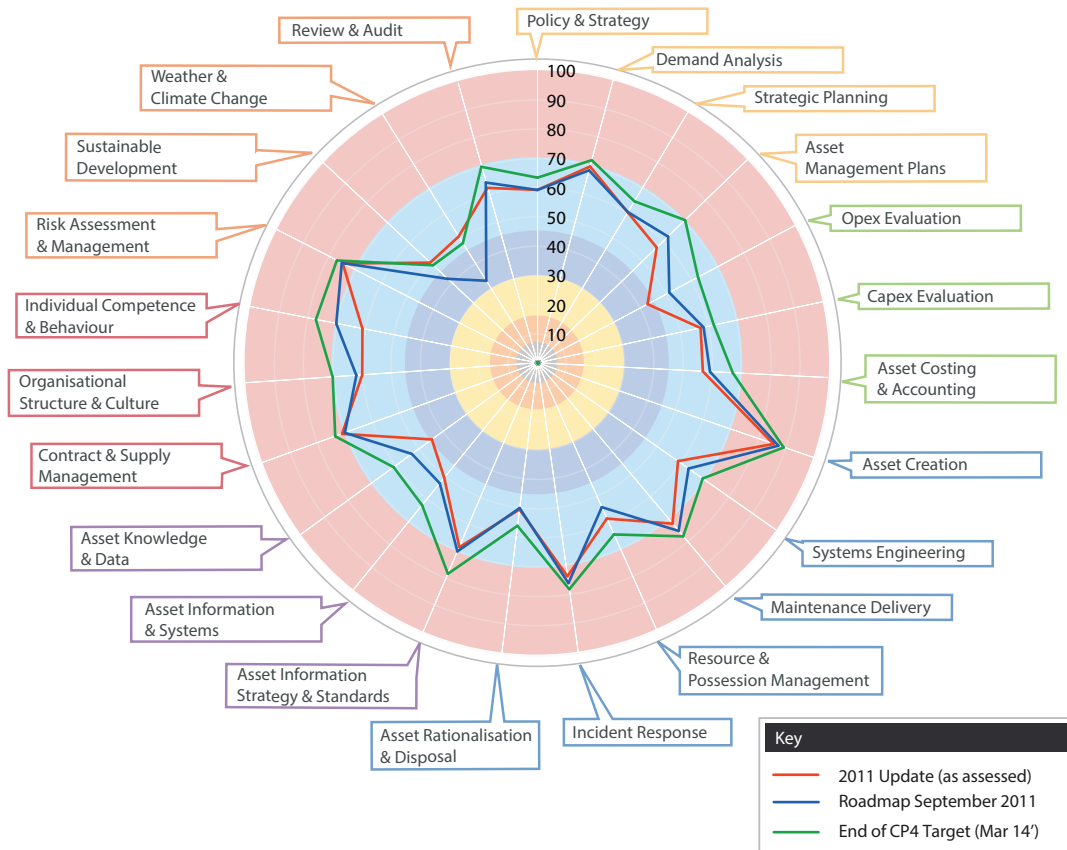

Diagram 1: Summary of AMEM Scores

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1   *2011 AMEM Assessment, Version 1.1, 6th December 2011*
2   *Asset Management Improvement Roadmap, Version 1.0, May 2010*

Of the 10 Activities assessed as part of the update, the capability maturity scores have improved for seven of these and the target for the IIP submission from the AMCL Roadmap has now been achieved in 9 of the 23 Activities.

It should be noted that the Asset Management capabilities vary quite significantly across the asset disciplines and those that are most developed, most notably Track, have achieved the Roadmap target for the IIP for a greater number of Activities.

Table 1 below shows the updated 2011 maturity scores compared to the IIP Roadmap at the Activity Group level which is consistent with the method used by the ORR to track progress against the trajectory[3].

Network Rail *as assessed June 2011*	Network Rail *as assessed 2009*	Network Rail *as assessed 2011 Update*	AMCL Target *Roadmap for IIP*
Strategy & Planning	56.3%	61.2%	62.0%
Whole-Life Cost Justification	47.3%	51.9%	56.0%
Lifecycle Delivery	64.8%	66.3%	67.0%
Asset Knowledge	51.7%	55.0%	59.0%
Organisation & People	63.0%	64.0%	67.0%
Risk & Review	49.5%	59.4%	53.0%

Table 1: Network Rail's 2011 Update Assessment Score by Activity Group

Table 1 shows that at the Activity Group level, Network Rail has achieved the AMCL Roadmap Target for IIP for only one of the six Activity Groups and, at the current rate of improvement, Network Rail would not achieve the end of CP4 targets for all six Activity Groups agreed between the Boards of the ORR and Network Rail.

It should be noted that one percentage point improvement is a significant improvement at the Activity Group level as it requires a percentage point improvement in each of the Activities that make up the Activity Group.

It should be emphasised that Network Rail's AMIP was intentionally not designed to address all of the 23 activities that are assessed within the AMEM. Those not dealt with in AMIP were to be

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3   http://www.rail-reg.gov.uk/upload/pdf/nr-cp4-success-010311.pdf

addressed by continuous improvement in Network Rail's asset management 'business as usual'. It is for this reason that we have reported the different levels of progress in completing the AMIP improvement deliverables and achieving the Roadmap IIP targets for the 23 AMEM Activities.

In the 2011 assessment report, we stated that the AMIP represents a significant commitment from Network Rail to improve its Asset Management capabilities to meet the challenges set out in the Roadmap. Significant resources have been allocated to the programme over the last 18 months. At the time of the 2011 assessment, 28 of the 33 AMIP deliverables that were planned for the IIP, were delivered broadly within the agreed timescales. Since then, the remaining deliverables have been completed, and some were updated as part of the IIP submission.

There are a number of reasons for Network Rail being behind the AMCL Roadmap trajectory for IIP despite its strong performance in delivering the AMIP deliverables:

• The scope of some of the AMIP deliverables is not aligned with the activities and success criteria defined in the AMCL Roadmap;

• There are a number of Activities where no improvements were defined in the AMIP or the AMCL Roadmap and achievement of trajectory is dependent on Network Rail closing the gap with best practice through other continuous improvement activities; and

• The assessment examines Network Rail's current capabilities in delivering Asset Management during CP4 as well as the work undertaken by the AMIP which tends to have a longer-term CP5 focus.

The 2011 assessment included an audit of Network Rail's compliance with the requirements of BSI PAS 55: 2008. We reported that conditional certification to the requirements of PAS 55 was awarded to Network Rail but that this certification was conditional upon the rectification of two major non-conformances and a number of minor non-conformances prior to the CP5 Strategic Business Plan (SBP) being issued. The two major non-conformances are summarised as:

1. Network Rail must demonstrate a clear 'line of sight' from its Asset Management Policy, Strategy and Route AMPs through to work delivery on the ground.

2. Network Rail must demonstrate that its asset information is fit for the purpose of supporting its Asset Management System decision-making requirements.

Network Rail has made progress in developing the 'line of sight' with the early development of the strategic framework and processes but further evidence will be required at the time of SBP that the 'line of sight' is effective in practice. The first non-conformance therefore remains open. Network Rail has also made progress in addressing the second major non-conformance in that it has now published the Data Quality Assessment Report which provides an assessment of Network Rail's position with confidence levels in data and information. Further work will be required to demonstrate that this data and information is fit for purpose but this has now been reduced to a minor non-conformance.

As reported in the 2011 assessment report, being behind the AMCL Roadmap targets for the IIP in a number of key areas is likely to make achieving the SBP and end of CP4 targets more challenging and strong leadership from Network Rail's senior team would be crucial in ensuring a constancy of approach to delivery of the AMIP. Since that assessment, Network Rail has made good progress in continuing to deliver improvements in its Asset Management capability but there are some significant challenges ahead if Network Rail is to achieve the end of CP4 targets in all 23 Activities.

In parallel to this assessment update, AMCL has been updating the Roadmap to define the improvement activities that Network Rail will need to undertake to address the shortfalls in achieving the IIP Roadmap targets and to achieve the capability maturity targets by the SBP submission and the end of CP4.

By the end of March 2012, Network Rail has committed to update its AMIP to align with the activities defined in this updated Roadmap and to deliver its own goal;

'…to achieve a level of asset management maturity that is at least as good as the best comparable organisations in the UK by the start of CP5'.

This AMIP update should include a fully resourced and integrated plan that shows how all the Asset Management initiatives (including BCAM and ORBIS) will be delivered including the identification of the key interfaces between these initiatives.

We reported in the 2011 assessment that devolution presents a number of risks and opportunities to Network Rail in developing its Asset Management capabilities. This update has confirmed that more work needs to be done to improve the clarity of the responsibilities and boundaries within the Asset Management system, in particular between the Centre and the Routes, to ensure the "line of sight" from the Asset Management Policy and Strategy to the local delivery of Asset Management activities is maintained. This has been reflected in the updated recommendations. We continue to believe, however, that if these risks are effectively managed, devolution presents Network Rail with significant opportunities to identify efficiencies and improvements in its Asset Management processes and practices in CP5 and beyond.

AMCL would like to take the opportunity to thank Network Rail and the ORR personnel for their time and effort in participating in this assessment.

1 Introduction

1.1
Objectives of this Mandate

In early 2011, Network Rail produced its Asset Management Improvement Programme (AMIP) which was agreed between the ORR and Network Rail Boards. Building on the AMCL Roadmap, the AMIP sets out Network Rail's roadmap to improve asset management capability at the IIP submission, SBP submission and the start of CP5.

A full AMEM assessment was carried out between April and June 2011 including a review of progress against the AMIP. Network Rail and the ORR requested further assessment work to be undertaken to take account of work that had been completed between when the assessment was undertaken and the publication of the IIP at the end of September 2011.

There are two objectives defined in the mandate for this work:

1. To update the 2011 AMEM Assessment to reflect the additional evidence that was developed as part of the IIP but not included in the original assessment and;

2. To update the AMCL Roadmap to define the capability improvement requirements which must be addressed to deliver the agreed trajectories for the SBP and the end of CP4.

This report describes the findings from the first of these objectives.

1.2
Scope of Work

The following additional evidence was presented by Network Rail as being representative of the position Network Rail was at at the time of the IIP submission.

- The updated Asset Policies (published September 2011);
- Asset Policies Executive Summary;
- The Asset Information Strategy and Roadmap (ORBIS);
- The Data Quality Assurance Report;
- A sample of Route Specifications;
- The Maintenance IIP Commentary;
- The QRA undertaken on the IIP work volumes and costs;
- The revised strategic framework;
- Updates to the risk management framework; and
- Network Rail's latest benchmarking activities.

This additional evidence resulted in the scores and findings being updated for the following AMEM Activities:

Group	Ref	Activity	Included in update?
Strategy & Planning	1.01	Policy & Strategy	No
	1.02	Demand Analysis	Yes
	1.03	Strategic Planning	Yes
	1.04	Asset Management Plans	Yes
WLC Justification	2.01	Opex Evaluation	Yes
	2.02	Capex Evaluation	Yes
	2.03	Asset Costing & Accounting	No
Lifecycle Delivery	3.01	Asset Creation (to be renamed)	No
	3.02	Systems Engineering	No
	3.03	Maintenance Delivery	No
	3.04	Resource & Possession Management	No
	3.05	Incident Management	No
	3.06	Asset Rationalisation & Disposal	No
Asset Knowledge	4.01	Asset Knowledge Strategy & Standards	Yes
	4.02	Asset Information Systems	Yes
	4.03	Asset Data & Knowledge	Yes
Organisation & People	5.01	Contract & Supplier Management	No
	5.02	Organisational Structure & Culture	No
	5.03	Individual Competence & Behaviour	No
Risk & Review	6.01	Risk Assessment & Management	Yes
	6.02	Sustainable Development	No
	6.03	Weather & Climate Change	No
	6.04	Review & Audit	Yes

Table 2: Activities included in Scope of 2011 Update Assessment

1.3
Activities Undertaken

This update has followed the same process as the 2011 assessment, but is limited to a smaller scope. Twenty two people were interviewed during January and February 2012 (listed in Appendix A), and twenty seven new pieces of evidence were assessed (listed in Appendix B with a unique reference number).

2 Overview of Findings

In the 2011 assessment report, it was stated that the AMIP represented a significant commitment from Network Rail to improve its Asset Management capabilities to meet the challenges set out in the Roadmap. Significant resources have been allocated to the programme over the last 18 months. At the time of the 2011 assessment, 28 of the 33 AMIP deliverables that were planned for the IIP were delivered broadly within the agreed timescales.

Since then, the remaining deliverables have been completed, and some were updated as part of the IIP submission. This update assessment has examined the extent to which these additional deliverables have improved Network Rail's capability maturity scores in the 10 Activities assessed using AMCL's Asset Management Excellence Model™ (AMEM).

Diagram 2 below shows the updated maturity scores alongside the original 2011 assessment and the Roadmap trajectory for the IIP:
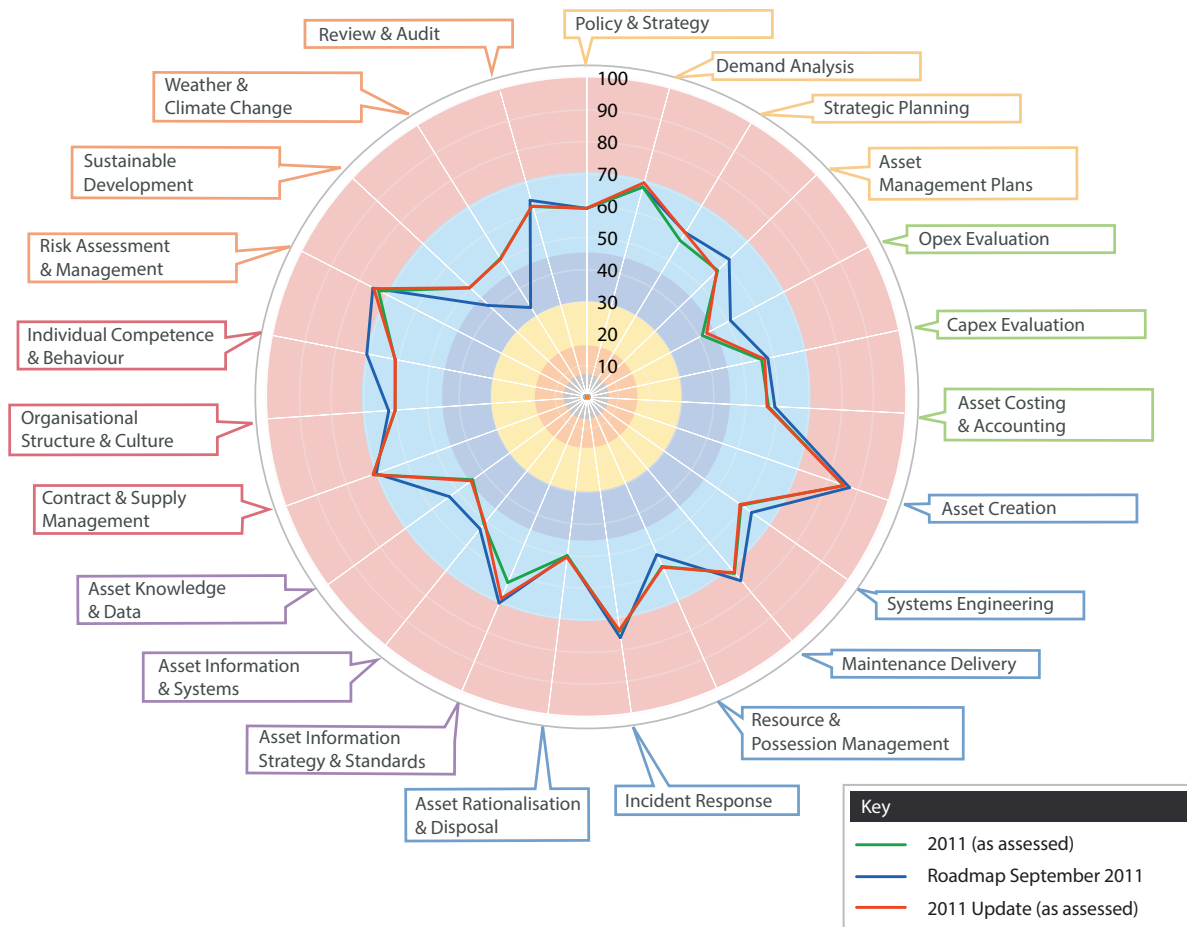
Diagram 2: Summary of AMEM Scores

This shows that, of the 10 activities assessed as part of the update, the capability maturity scores have improved for seven of these and the trajectory for the IIP submission from the AMCL Roadmap has now been achieved in nine of the 23 Activities.

It should be noted that the Asset Management capabilities vary quite significantly across the asset disciplines and those that are most developed, most notably Track, have achieved the AMCL Roadmap trajectory for IIP for a greater number of Activities.

These scores and a commentary on the 10 Activities assessed as part of this update are discussed further in the following sections.

3 Asset Management Strategy & Planning

3.1
Overview of AMEM Scores

Table 3 below shows the four Activities within the Asset Management Strategy and Planning Group and the changes in capability maturity scores where relevant.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Policy & Strategy	42%	54%	59%	59%	59%	Not assessed
Demand Analysis	59%	64%	68%	68%	69%	Increase due to publication of Route Specifications
Strategic Planning	48%	55%	57%	60%	60%	Increase due to: • Strategic planning framework • QRA • Updated Asset Policies • Updated Route AMP template
Asset Management Plans	47%	52%	57%	62%	57%	No Change

Table 3: Strategy & Planning Group Scores

A commentary on the Activities assessed is included below.

3.2
Demand Analysis

The new evidence available during this update assessment was the Network and Route Specifications. This has resulted in the maturity score for Demand Analysis increasing by one percentage point to 69% which is now beyond the Roadmap trajectory for the IIP submission for this Activity.

These documents provide the link between the Route Utilisation Strategies (RUSs) and the planned Asset Management activities on the ground. They are published in accordance with the Initial Industry Plan and will be a key future part of the forward planning process for the rail network. The Network Specification sets out the current context, capability and future plans for the route. The Route Specifications form an appendix to the main Network Specifications and set out the capabilities of each strategic route section and future schemes in more detail.

The Network Specifications contain a high-level overview of the route including a description and its context, its key passenger and freight markets and traffic flows, and the Train Operating Companies' (TOC's) planned Public Performance Measures over the CP4 period. These documents also contain a summary description at route level of planned infrastructure investment for CP4, proposed investment for CP5 and the outline strategy beyond CP5.

The Route Specifications describe in more detail at Strategic Route Section (SRS) level the planned activities and targets over immediate, 10 and 30 year timeframes. They contain a brief overview of the SRS plus, in tabular form:

- route information (for example route availability, gauge, speed etc.);

- current and anticipated passenger and freight train service levels;

- proposed changes in level crossing populations; and

- the planned and proposed infrastructure investment in CP4 and CP5 respectively.

Although infrastructure investments are summarised in the Route Specifications there is nothing which describes potential changes to maintenance requirements for the SRS. It may be that infrastructure investment is being deferred or there is scope to improve performance through revised maintenance practices. These will potentially have an effect on the performance or capacity on the route and may affect train services levels through greater (or lesser) demand for access. The Route Specifications are at the first stage of development and require further work to include the following as part of the SBP submission:

• Target infrastructure minutes delay;

• Capacity requirements of the infrastructure including headway and timetable;

• Required capability of the infrastructure including gauge, line speed and bridge strength; and

• Infrastructure availability including allowance for possessions.

There was one recommendation relating to Demand Analysis made in the 2011 assessment and this has been updated to reflect the progress made by Network Rail on the development of Route Specifications to date. Details can be found in Section 11 of this report.

3.3
Strategic Planning & Asset Management Plans

Several new items of evidence were reviewed as part of this update that impact on Strategic Planning. These have resulted in an increase in the maturity score for Strategic Planning of three percentage points from 57% to 60% which is consistent with the Roadmap trajectory for the IIP submission.

The new Route AMP template was reviewed and this is one of the sources of new evidence that has contributed to the increase in score in Strategic Planning. However, the maturity score for Asset Management Plans has stayed the same as this covers the actual Route AMPs themselves which have not been updated since the 2011 assessment.

The draft strategic planning framework, which is being developed as part of the Systems, Process and Monitoring document was reviewed. The draft strategic planning framework breaks the Network Rail Asset Management Framework down into the key process steps that describe Network Rail's overall Asset Management System. The framework also identifies the accountable Exec leader, decision support tools, systems, controls, enablers and other documents for each step of the process. At the time of the IIP submission, the strategic planning framework existed at the top level, but there are two further levels of detail which require putting in place. It is believed that many of the components are already in place but that there are consistency and integration issues to address before the framework can be said to be fully implemented.

The development of this framework is addressing one of the recommendations made in the 2011 assessment which was to provide greater clarity about how the various Asset Management processes, models and asset information are integrated to produce Network Rail's Asset Management policies, strategies and plans. There is further work needed to complete this framework, in particular to articulate the split of accountabilities and responsibilities between the Centre and the Routes and how these will change over time as the Asset Management teams in the Routes mature. It is understood that the framework will be completed, communicated to internal stakeholders and implemented by the end of April 2012. The relevant recommendation from the 2011 assessment has been updated accordingly.

The Quantified Risk Assessment (QRA) that was undertaken on the IIP work volumes and costs was assessed as another additional source of evidence within Strategic Planning. The output from the initial analysis is a range of likely renewal costs in CP5 that are necessary to deliver the required outputs sustainably and on a minimum whole life cost basis. Each of the asset groups was assessed separately and ranges of uncertainty produced for all the key activities under each asset group.

The QRA examined the uncertainties in both work volumes and unit costs using teams from each asset group to estimate the levels of uncertainty. For work volumes, this was based on uncertainties in both the policy development process and the reliability of the asset information used to apply

the policies to forecast the work volumes. For unit costs, this was based on the uncertainties around the unit cost information used to determine the policy interventions and expenditure forecasts, and also the uncertainty around the level of reduction in unit costs that could be achieved by the end of CP5. There is further work to do to improve the alignment of the QRA with data quality measures and to improve the estimates of uncertainty made by the asset teams in time for the SBP and the relevant recommendation from the 2011 assessment has been updated to reflect this.

The final source of new evidence that has impacted on the score for Strategic Planning is the September 2011 version of the Asset Policies that were submitted as part of the SBP. Although Asset Policies are primarily assessed within the Capex and Opex Evaluation Activities, there are a number of criteria within Strategic Planning that are also impacted. The increase in score in Strategic Planning associated with the Asset Policies is primarily as a result of the improvements made to the asset criticality analyses.

Details on the updates to the recommendations relating to Strategic Planning and Asset Management Plans can be found in Section 11.

4 Whole-life Cost Justification

4.1
Overview of AMEM Scores

Table 4 below shows the three Activities within the Whole-life Cost Justification Group and the changes in capability maturity scores where relevant.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Capex Evaluation	48%	53%	56%	58%	57%	Increase due to updated Asset Policies
Opex Evaluation	34%	38%	41%	51%	42%	Increase due to • Draft maintenance strategy • Updated Asset Policies
Asset Costing & Accounting	44%	51%	57%	59%	57%	Not assessed

Table 4: Whole-life Cost Justification Group Scores

A commentary on the Activities assessed is included in the following sections.

4.2
Capex Evaluation

The new evidence assessed as part of this 2011 update was the September 2011 version of the Asset Policies that were included as part of the IIP submission. These policies have been separately reviewed by AMCL (Track, Signals, Electrical Power and Telecoms)[4] and Arup (Track, Structures, Earthworks and Buildings) as part of the ORR's IIP progressive assurance process. As part of this progressive assurance work, the Asset Policies were assessed against the following three key criteria, set by the ORR:

• Robustness,

• Sustainability,

• Whole-life whole system efficiencies.

The Capex Evaluation scores for all asset groups have been updated based on the findings from this progressive assurance work and a further assessment of the Asset Policies against the AMEM assessment criteria. The scores for the Asset Policies themselves are summarised in Section 4.4 as these also include an assessment of the Opex Evaluation scores for the maintenance aspects of the Asset Policies.

As we reported in the 2011 assessment, Network Rail has implemented a 10-stage Asset Policy development process for all Asset Policies which is considered by AMCL to be commensurate with current good practice. The process assures a consistent, logical and structured framework for the development work and enables common formatting of the suite of documents. This represents a significant improvement over the process used to develop the CP4 Asset Policies.

At this stage of the periodic review process for CP5, the 2011 Asset Policies represent good work-in-progress towards the development of robust, sustainable and efficient Asset Policies in time for the SBP. As well as the 10-stage development process, Network Rail has developed a three-tier modelling approach and notably a new suite of Tier 2 whole-life cycle cost models for each asset group. However, as was discussed in Section 3.3, the strategic framework that defines how the different tiers of models and the Asset Policies are integrated as part of a holistic Asset Management process is still not fully developed and the interfaces between the models and the Asset Policies are not yet fully developed.

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4   *http://www.rail-reg.gov.uk/pr13/PDF/arup-asset-policies-2011-review.pdf*

A number of specific proposals for improving the Asset Policies were made for each asset group as part of the IIP progressive assurance work, the detail of which can be found in the separate reports referenced earlier. In addition to these asset group specific proposals, the following proposals were made for improving the Asset Policies that apply to all the asset groups:

1. Development of the Asset Policies and models to consider a whole system approach, including interfaces with other asset groups and analysing the whole life costs of the overall system.

2. Further development of Route Asset Management Plans to demonstrate a clear 'line of sight' between the Asset Policies and the bottom-up costs and work volumes.

3. Further development of the Tier 2 whole-life cycle cost models to validate the assumptions within the models, including degradation rates, and the intervention volumes proposed.

4. Further integration of the Tier 1 and Tier 2 models and provision of greater assurance that the workbanks have been developed in accordance with the rules defined by the Tier 2 models and captured within the Asset Policies.

5. Definition of the levels of outputs and remaining life that represent a sustainable level of investment.

6. Modelling of relevant outputs that are expected to be delivered by the application of each of the Asset Policies over the next five control periods and comparison of these to the sustainable levels defined above.

7. Further development of the Quantified Risk Assessment, which outlines uncertainty ranges for volumes and efficiencies, as an integral and clearly linked element of the models and Asset Policies.

8. Greater clarity on the required improvements in asset information used to inform the Asset Policies and models for SBP and how these will be delivered through the ORBIS project.

9. Greater clarity on the derivation of the efficiencies that will be delivered as a result of the improved asset information delivered through the ORBIS project.

10. Clearer quantification of the embedded efficiencies within the CP5 Asset Policies when compared to the CP4 Asset Policies.

11. Further development of maintenance strategies and the optimisation of maintenance and inspection activities on a cost-risk basis to achieve further scope efficiencies during CP5.

12. Improved clarity on the nomenclature relating to the different options identified in Asset Policies to achieve specific output scenarios.

In the 2011 AMEM assessment, 10 recommendations were made relating to Capex Evaluation. Of these, one has been closed and a further five have been rationalised leaving a total of four open recommendations which also take into account the proposals for improving the September 2011 Asset Policies discussed above. Details of all recommendations can be found in Section 11 of this report.

4.3
Opex Evaluation

The September 2011 Asset Policies were also assessed using the AMEM assessment criteria for Opex Evaluation, but in most cases, the maintenance aspects of the Asset Policies had not developed significantly since the June version of the policies which were reviewed as part of the 2011 assessment. The primary reason for the increase in the maturity score for Opex Evaluation by one percentage point to 42% is the Maintenance IIP commentary document that was produced as part of the IIP submission.

This provides the basis for the development of an overall maintenance strategy for Network Rail which addresses one of the recommendations made in the 2011 assessment. The document requires further development as the current focus is on delivery of efficiencies and it does not yet address the strategy for developing risk-based maintenance and inspection regimes. It includes a number of maintenance principles which appear to be aligned with Network Rail's Asset Management Strategy and general good practice in this area but Network Rail should consider putting greater emphasis on Failure Mode Effects and Criticality Analysis (FMECA) and risk-based maintenance in its Maintenance Strategy.
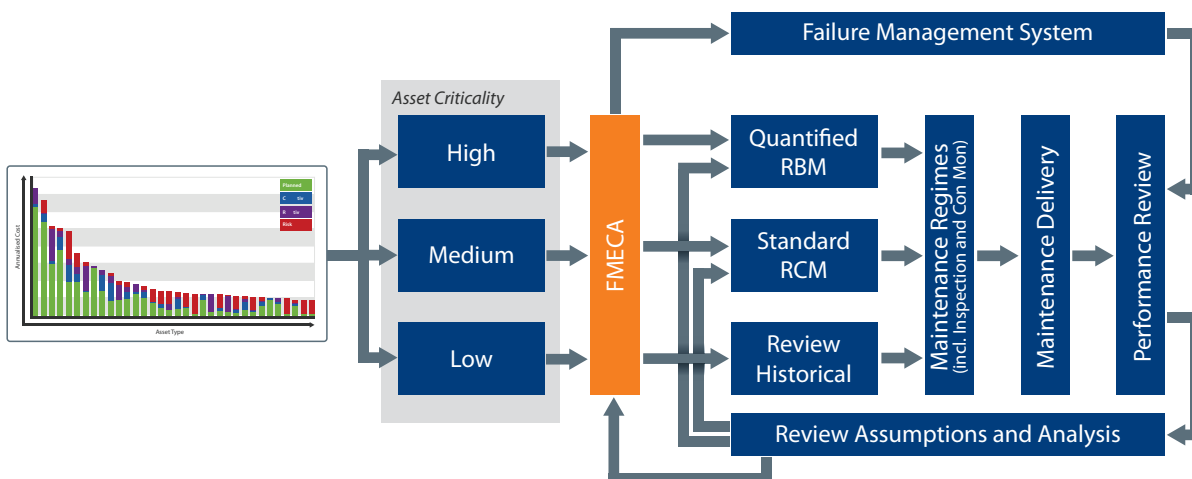
Diagram 3: Failure Mode Effects and Criticality Analysis (FMECA) - *source: AMCL*

FMEA and Criticality-Based Maintenance are introduced in the document but the approach proposed does not appear to set out a complete risk-based maintenance approach that will enable Network Rail to predict the expected reliability and safety outcomes from applying different maintenance regimes across its asset base. This approach should define the high-level process that Network Rail intends to adopt to develop its risk-based maintenance and inspection regimes. As we have previously reported, there are significant scope efficiencies to be realized from adopting a full risk-based maintenance approach.

The Maintenance IIP commentary explains how ORBIS will help support the maintenance function with iPhone and location applications which should indeed be a benefit to maintainers, but does not explain how ORBIS will support the information requirements necessary to adopt a FMECA and risk-based maintenance approach. This will require a significant improvement in the understanding of failure rates at failure mode level and the consequences of failure. A separate audit is currently being undertaken by AMCL to review Network Rail's overall approach to failure management, including the definition and capture of failure information.

Finally, the Maintenance IIP commentary discusses Intelligent Infrastructure but this needs to be incorporated into the overall maintenance strategy and considered as part of determining the optimum maintenance, inspection and remote monitoring interventions.

Opex Evaluation is showing one of the biggest gaps from the current maturity score to the Roadmap trajectory. In the 2011 AMEM assessment, five recommendations were made relating to Opex Evaluation which focused on Network Rail's approach to determining maintenance requirements. These have been rationalised into a single recommendation on the development of a risk-based maintenance strategy covering all the points raised above which is the first key deliverable Network Rail needs to put in place to develop its capability maturity in Opex Evaluation. The Asset Management Roadmap update, being progressed in parallel with this update assessment, will build on this recommendation and define a number of additional capability statements that Network Rail will need to deliver to recover the shortfall and achieve the Roadmap trajectory by the end of CP4.

4.4
Summary of Asset Policy Scores

CP5 Asset Policies as issued with the IIP in September 2011 are shown below alongside the scores for the June 2011 CP5 Asset Policies and the CP4 Asset Policies for the four high priority asset groups.
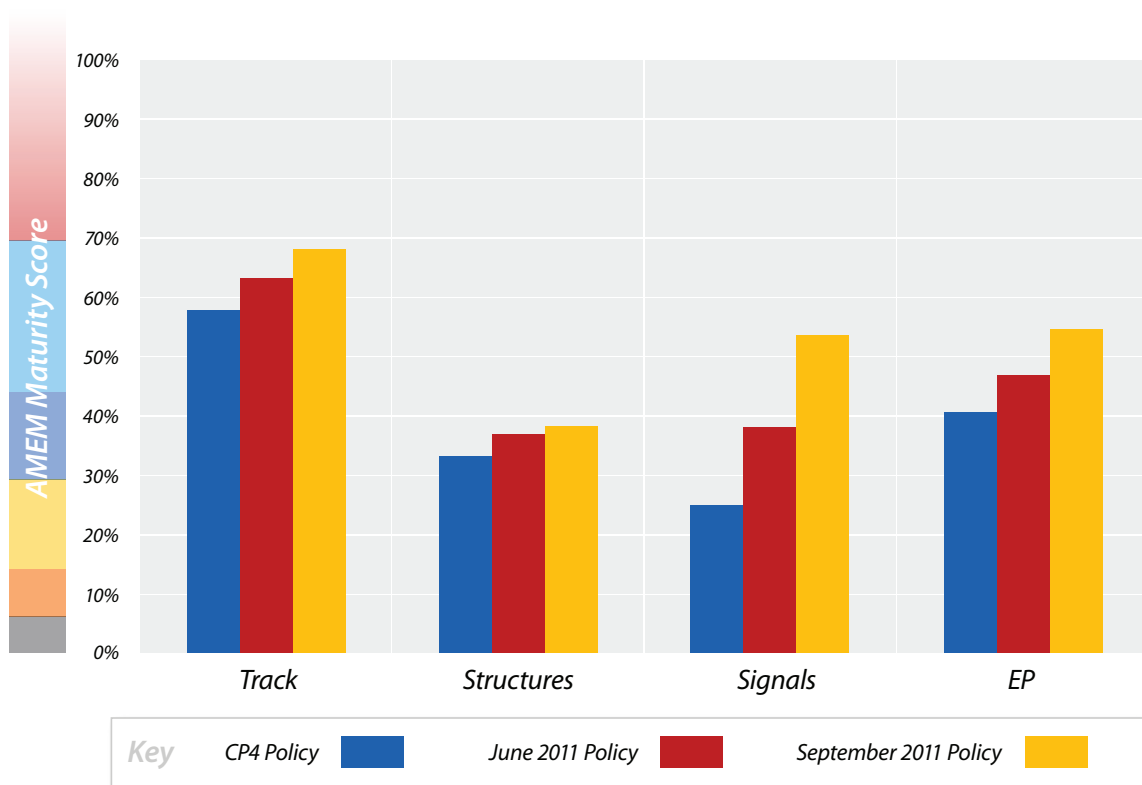

Diagram 4: Summary of Asset Policy Scores

As discussed in Section 4.2, these policies have been separately reviewed by AMCL (Track, Signals, Electrical Power and Telecoms) and Arup (Track, Structures, Earthworks and Buildings) as part of the ORR's IIP progressive assurance process

5 Lifecycle Delivery

Table 5 below shows the six Activities within the Lifecycle Delivery Group. This Group was not assessed in this update so the scores remain the same as the 2011 assessment and no additional commentary is provided.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Asset Creation	76%	85%	85%	87%	85%	Not assessed
Systems Engineering	60%	59%	59%	63%	59%	Not assessed
Maintenance Delivery	68%	74%	72%	75%	72%	Not assessed
Resource & Possession Management	47%	51%	58%	54%	58%	Not assessed
Incident Response	72%	74%	74%	76%	74%	Not assessed
Asset Rationalisation & Disposal	45%	46%	50%	50%	50%	Not assessed

Table 5: Lifecycle Delivery Group Scores

6 Asset Knowledge

6.1
Overview of AMEM Scores

Table 6 below shows the three Activities within the Asset Knowledge Group and the changes in capability maturity scores where relevant.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Asset Information Strategy & Standards	58%	61%	63%	70%	69%	Increase due to ORBIS
Asset Information Systems	42%	51%	51%	53%	51%	Marginal increase due to business impact assessment of systems
Asset Knowledge & Data	37%	43%	44%	53%	45%	Increase due to Asset Data Confidence Grading and ADIP for SBP

Table 6: Asset Knowledge Group Scores

A commentary on the Activities assessed is included in the following sections.

6.2
Asset Information Strategy & Standards

The Asset Information Strategy & Standards Activity has seen the largest increase in maturity score across the 10 Activities assessed in this update with an increase of six percentage points from 63% to 69%. This is mainly due to the availability for this update assessment of Network Rail's Asset Information Strategy Vision & Roadmap, plus associated appendices, now commonly known as ORBIS (Offering Rail Better Information Services).

The ORBIS documentation provides a significant increase in definition and granularity of Network Rail's overall approach and plans for asset information and associated systems. It also provides clarity of the sequencing, costs, benefits and risks of the ORBIS programme. At the time of the original 2011 AMEM Assessment, only a 'High-Level AIS Vision' was available. As we reported in our detailed review[5] of that early documentation, ORBIS *"represents a potentially revolutionary step forward in the company's approach to asset information"*. The consideration of the more recent and detailed documentation as key evidence in this update assessment has reaffirmed that position and ORBIS appears to represent a best industry practice Asset Information Strategy. However, it should be noted that the ORBIS documentation was considered from an evidence perspective only as part of this update assessment and was not subject to detailed review as part of this process. A detailed review is currently being specified by the ORR under a separate mandate.

One key opportunity that was noted during this update assessment is to ensure the alignment of ORBIS with Network Rail's developing Asset Management System and the information requirements that this will identify. The purpose of ORBIS is to assure asset information required by Network Rail and its stakeholders is available in the right place, at the right time and to the right quality. Whilst ORBIS utilised extensive input from the wider business (including the Asset Management Strategy and relevant Asset Management activities and processes to develop initial requirements) the development of ORBIS and its subsequent initial implementation has continued at a significant pace. As a result it will be important for Network Rail to ensure that ORBIS systematically continues to align with the developing and refining of the business's Asset Management activities, particularly the emerging Asset Management System.

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5   *'Review of Phase 1 AIS', Version 1.0' AMCL - 15th December 2011*

The Asset Information Strategy should therefore reflect the high-level Asset Management processes and their scope as defined within the Asset Management System, with the key decisions within these processes and the information necessary to support them captured. The capability, stewardship and performance KPIs that will be used to monitor the effectiveness of the Asset Management System should also be captured within the Asset Information Strategy, and this should be reviewed at a periodicity consistent with reviews and updates to the Asset Management System.

In summary, whilst being cognisant of the above issue, the availability of the ORBIS documentation has provided a significant increase in maturity capability for the strategy elements of the Asset Information Strategy & Standards Activity.

However, the Activity as a whole also extensively considers the criteria relating to the Asset Information Specification, Asset Knowledge Standards and Asset Information Plans. As was the case in the 2011 assessment, elements of these have been in place for some time to enable business-as-usual activities within Network Rail and were recently boosted by the development of the Asset Data Improvement Plan (ADIP) for IIP. Further evidence was also provided during this update assessment of continued improvements in this area relating to the ADIP plans for SBP and the development of an 'As-Is Data Dictionary', both of which are considered by AMCL to be evidence of development, although not yet subject to detailed review.

The bulk of Network Rail's work to develop an Asset Information Specification, Asset Knowledge Standards and Asset Information Plans is understood to be undertaken by the Master Data Management ORBIS workstream. Until this work is completed, the overall scores for the Asset Information Strategy & Standards AMEM Activity will continue to be ostensibly constrained, even with a best practice Asset Information Strategy in the form of ORBIS. To provide clarity of how the scores are currently made up, Diagram 5 below shows the maturity scores for the two key elements of the overall Asset Information Strategy & Standards AMEM Activity.
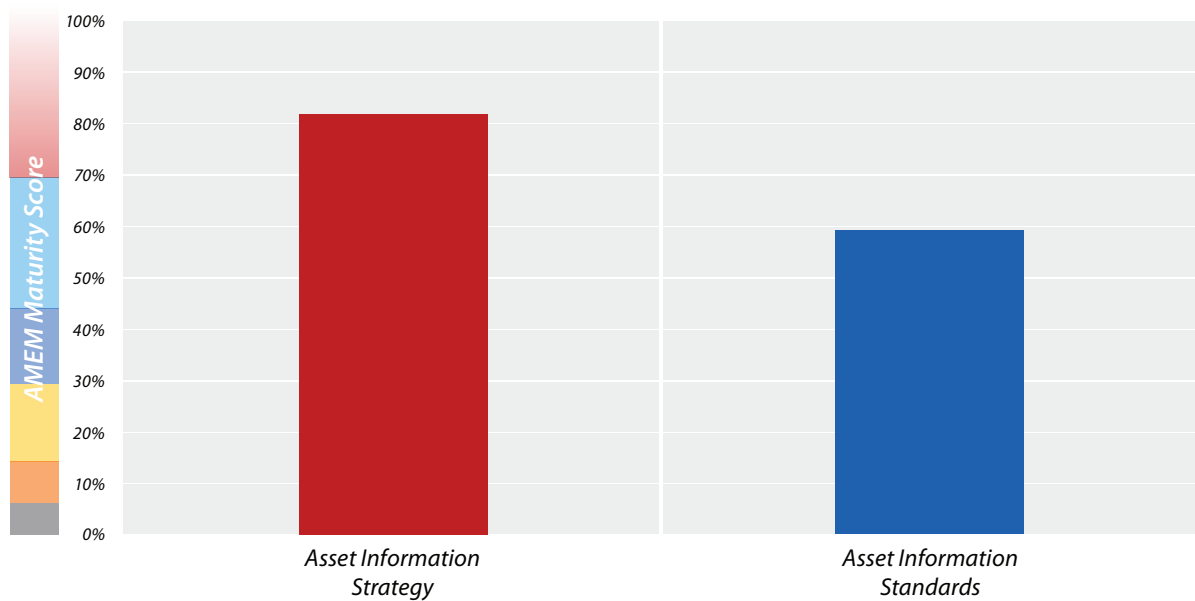
Diagram 5: Asset Information Strategy & Standards Scores

In the 2011 AMEM assessment, one recommendation was made relating to Asset Information Strategy & Standards, focused on a detailed review of the overall ORBIS documentation when available. This recommendation has been closed as a result of the mandate, developed by the ORR, for such an audit, although the audit is yet to be initiated.

Details of all recommendations can be found in Section 11 of this report.

6.3
Asset Information Systems

The provision of further evidence within the Asset Information Systems AMEM Activity for this update assessment was limited to a process for undertaking Business Impact Assessments (BIA) of new or altered systems, relating to the Systems Continuity Planning criterion and the development of a 'Bridging System' in the Civils arena, relating to the Management Information Reporting System criterion.

Both pieces of further evidence were considered by AMCL to provide an increase in maturity capability over the 2011 assessment but had relatively limited impacts on the overall organisation wide assessment of capability maturity for Asset Information Systems and the capability maturity score for Asset Information Systems remains at 51%.

The BIA process, although aligned with the corporate risk framework, had limited application to systems in the two to three years Network Rail estimated it had been in place and a number of key systems still remain to be assessed. This process is also considered to only form part of an overall Systems Continuity Planning approach.

The 'Bridging System', which collates data from CARRS and ALARM to enable monitoring of examination compliance on structures, was considered to be beneficial but was stated as an interim solution only and applies to a single asset discipline.

As a result, the overall capability maturity score increase for this update assessment, over the 2011 AMEM Assessment, was marginal for the Asset Information Systems AMEM Activity. It is also worth noting that whilst this AMEM Activity is significantly behind the original AMCL Asset Management Roadmap trajectory, the development of systems is considered by AMCL to have been partly delayed by the development of the Asset Information Strategy (ORBIS) and subsequent Asset Information Specification, Asset Knowledge Standards and Asset Information Plans. Appropriate trajectories for this AMEM Activity going forward will be considered in the parallel revision of the Asset Management Roadmap.

In the 2011 AMEM assessment, eight recommendations were made relating to Asset Information Systems. Of these, one has been closed and the others remain open.

Details of all recommendations can be found in Section 11 of this report.

6.4
Asset Knowledge & Data

The new evidence assessed as part of this update assessment for the Asset Knowledge & Data AMEM Activity was the ADIP data Improvements for SBP and Network Rail's recently developed Confidence Grading Methodology. This additional evidence has resulted in an increase in the capability maturity score for Asset Knowledge and Data of one percentage point from 44% to 45%.

The ADIP data improvements for SBP were found to have been developed using a robust process of review and challenge with internal stakeholders responsible for SBP submissions. As we found in our review of the ADIP data improvements for IIP [6], the process and programme for ADIP implementation again appear to be well documented and managed. A slight increase in capability maturity for the Activity has been acheived as a result of the significant work being undertaken by the ADIP team to support SBP. However, the increase in overall score was constrained due to the data improvements for SBP being a sub-set of overall asset information required by the organisation and its stakeholders, the limited timescales and targets involved and the existing recognition of the good capability maturity of the ADIP workstream in the 2011 assessment.

For this update assessment Network Rail also presented its recently developed Asset Data Confidence Grading Assessment Methodology (ADCGAM), summarised in Diagram 6, and associated Toolkit.

Scope Definition & Initial Setup Activities

1 Define & Sign-off Scope
2 Assign Roles & Responsibilities
3 Parameter Settings
4 Assign Weightings for Asset Types & Attributes
5 Decide & Sign-off Sampling Method

Data & Evidence Gathering Analysis

6 Governance Evaluation (Alpha Score)
7 Dataset Evaluation (Numeric Score)
8 Aggregation of Scores

Report & Final Signoff

9 Generate Report & Sign off
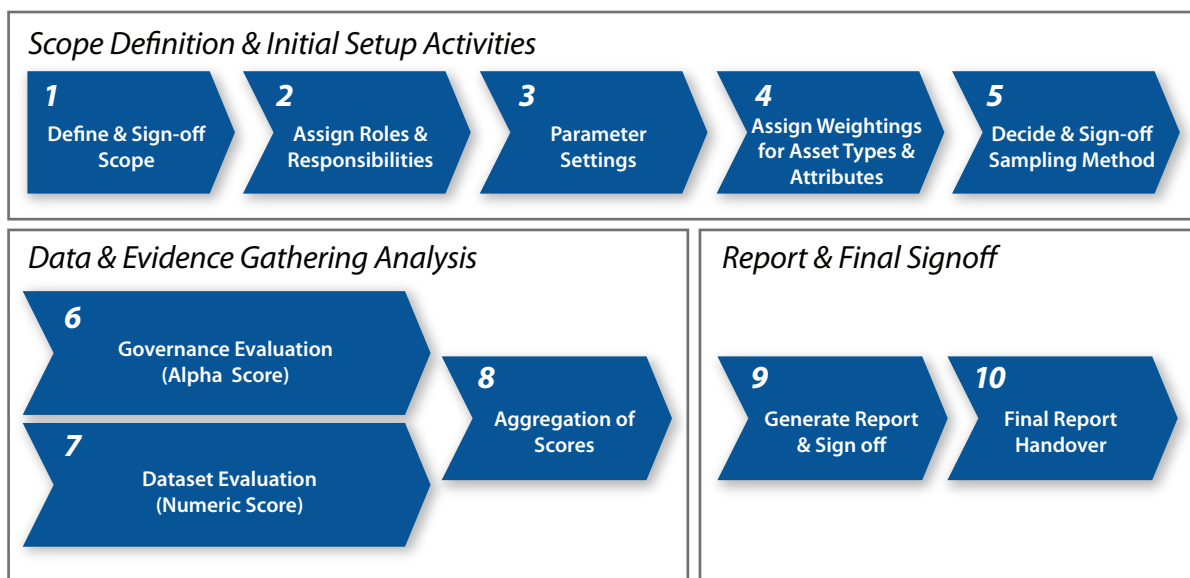**10** Final Report Handover

Diagram 6: Ten Step ADCGA Methodology (Network Rail)

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6   *'Review of Phase 1 AIS', Version 1.0' AMCL - 15th December 2011*

Although, understood to be subject to separate independent review by the ORR, the ADCGAM and Toolkit appear to provide a sound, assured and flexible approach to the assessment of confidence grading for asset data. This directly addresses one of the major non-conformances against the requirements of PAS 55 that was identified in the 2011 assessment which is discussed further in Section 9. However, it is understood that the methodology has not yet been applied so has had little impact on the Effectiveness and Integration elements of the AMEM capability maturity scores at this stage.

In the 2011 assessment, seven recommendations were made relating to Asset Knowledge & Data. None of these have been closed as a result of the further evidence considered in this update assessment.

Details of all recommendations can be found in Section 11 of this report.

7 Organisation & People

7.1
Overview of AMEM Scores

Table 7 below shows the three Activities within the Organisation & People Group. This Group was not assessed in this update so the scores remain the same as the 2011 assessment and no additional commentary is provided.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Contract & Supply Management	56%	68%	71%	70%	71%	Not assessed
Organisational Structure & Culture	60%	60%	60%	62%	60%	Not assessed
Individual Competence & Behaviour	55%	61%	61%	70%	61%	Not assessed

Table 7: Organisation & People Group Scores

8 Risk & Review

8.1
Overview of AMEM Scores

Table 8 below shows the four Activities within the Risk and Review Group and the changes in capability maturity scores where relevant.

Activity	2006 Score	2009 Score	2011 Score	2011 Roadmap Target	2011 Updated Score	Comments
Risk Assessment & Management	65%	73%	73%	75%	75%	Increase due to early implementation of new integrated risk management standard
Sustainable Development	28%	35%	50%	42%	50%	Not assessed
Weather & Climate Change	n/a	28%	51%	33%	51%	Not assessed
Review & Audit	56%	62%	62%	64%	62%	No Change

Table 8: Risk & Review Group Scores

A commentary on the Activities assessed in included in the following sections.

8.2
Risk Assessment & Management

The maturity score for Risk Assessment & Management has increased by two percentage points from 73% to 75% and has now achieved the Roadmap trajectory for the IIP submission. The new evidence that has resulted in this increase was the introduction of the new Level 2 'Integrated Risk Management' (IRM) standard which was still a concept at the time of the original 2011 assessment. In addition to this, evidence was provided that the approach set out within the new Level 2 standard is beginning to be applied within Network Rail's Asset Management activities.

The new IRM standard differs from its predecessor in that it is far less prescriptive, but provides a clear framework and philosophy for the application of risk management within Network Rail that is consistent with current best practice, such as ISO31000. The Risk Management Framework described within the new IRM standard has been signed off by the Network Rail Board, and the IRM standard itself is currently in consultation. It has a planned launch date of March 2012 and a compliance date of June 2012.

The new IRM standard defines the 'why' but not the detailed 'how' of Network Rail's risk management approach. The detailed approach to risk management will be published on-line in the 'Risk Management Handbook'. The Audit Committee now becomes the Audit & Risk Committee (A&RC), and will now take accountability for the Executive Risk Register which has been created in accordance with the new Risk Management Framework and it is planned to be signed off by the A&RC in February 2012.

Each part of the organisation will now have an 'account manager' in the Head of Risk's team, whose responsibility will be to liaise with local 'Risk Champions', who will have day-to-day accountability for local risk management activities. Risk Champions were in place at the time of AMCL's first assessment of Network Rail in 2006 as a way of helping to embed the new Risk Management Framework and ARM system. It is not known whether the current Risk Champions will be a temporary measure to help embed the revised approach or whether they will be a more permanent arrangement.

Evidence was provided by the Risk Champion in the of Asset Management Director's team of how the new Risk Management Framework was being applied. This was described in two main areas:

• Day-to-day application – how the Asset Management team apply the Risk Management Framework; and

• Risk tolerance – how the Asset Management team are seeking to support section 5.2 of the IRM standard to define risk tolerance by defining risk tolerability consistently across assets.

The day-to-day application of the Risk Management Framework consists of regular review meetings to identify, assess and manage risks which are recorded in the ARM system. There are a number of these meetings which were reported to be at various stages of maturity, the main area of development being to try to move from reactive management of risks to a more pro-active management of risks – specifically through the focus on managing risks to achieving objectives. The 'risk pyramid' approach described in the 2011 assessment report has been utilised to support this activity, but it is not yet felt to be properly embedded. A desire to use more formal techniques (such as Failure Modes & Effects Analysis – FMEA) was expressed, and if implemented this would clearly demonstrate linkage between the Risk Management and Asset Management systems.

The various risks recorded in ARM are brought together on a quarterly basis in the 'Asset Management Risk Review Pack' which is reviewed at the Asset Management Director's team meeting. The approach for matching 'top down' and 'bottom up' risks is not straightforward in the ARM system, and is being managed in a separate spreadsheet. The top down risks are know as 'Parent' risks and are those reviewed at the A&RC level, while the bottom up ('Child') risks are monitored at the functional (Asset Management) level. The separate spreadsheet clearly references between these two levels, with the Child risks all recorded in ARM.

The work to define risk tolerability consistently across asset types is in the early stages of development. The rationale for the work is to address the current approach which is based on ALARP / SFAIRP but gives no clear idea of acceptability. This approach is often repeated in the Asset Policies. The ORR and the DfT are both key stakeholders, from an operational and safety viewpoint, and the current default position is to always maintain risk levels. The work is concentrating on setting a common framework and terminology for the assessment of risk tolerability and the Safety Risk Model (as used by the RSSB and Network Rail) is to be used as the basis.

In order to bring more consistency to the application of the IRM standard to Asset Management the risk champion has produced a continuous improvement framework which includes business objectives, risks, controls and monitoring as elements. It is believed that these elements are broadly in place, but not as well integrated as they could be. For example, the link between business objectives and risks has been intuitive in the past, although it is now required under the new IRM standard. The management of controls is not as effective as it could be, and the monitoring of risks is predominantly reactive (for example through incident management) rather than pro-active (through the defined governance structure). The introduction of the new IRM standard needs to be accompanied by a cultural shift in risk management to make this integration effective.

In summary, Network Rail's risk management approach is in the process of being revised through the introduction of the new Risk Management Framework and IRM standard. However, a more work is required to demonstrate that this new approach has effectively integrated the various risk management activities that currently exist and the one recommendation that was made in the 2011 assessment has been updated accordingly.

8.3
Review & Audit

The new evidence available during this update assessment was primarily the introduction of the strategic planning framework and further evidence on Network Rail's benchmarking activities. As discussed in Section 3.3, the strategic planning framework is a high-level description of the overall Asset Management process within Network Rail and has been put in place to help close the loop on the strategic planning processes in the context of devolved routes. The importance of the framework from a Review & Audit perspective is that it provides a consistent framework against which compliance in the implementation of Asset Management planning can be monitored which is a key requirement of PAS 55.

The framework should also be used as the basis for developing the audit and engineering verification activities and the 2011 recommendations for Review and Audit have been updated to reflect this.

Benchmarking is an activity that Network Rail is increasingly using to help identify value based improvements to its activities through challenging established Network Rail behaviours and policies. In general there are three types of benchmarking that Network Rail is involved with which are:

- Top-down benchmarking – for example the engineering assessment of expenditure at asset level, or econometric benchmarking;

- Framework benchmarking – for example through maturity assessment frameworks such as the AMEM or the Institute of Project Management; and

- Bottom-up benchmarking – for example the assessment and comparison of unit costs.

For maintenance and renewals, a number of benchmarking activities have been completed across the three types of benchmarking summarised above. It was recognised early on in this work that it was extremely difficult to normalise costs when comparing Network Rail's unit costs with those of continental rail administrations. The approach adopted has therefore been a direct observation of activities to identify the main factors that would influence costs, by comparing continental approaches with those adopted in the UK. These factors were then used to adjust the UK unit costs. For example, some of the most significant differences identified included:

- Lower UK labour costs but no 'multi-skilled' staff;

- No requirements for dedicated safety personnel;

- Possession strategies and the impact of Schedule 4 and 8 penalties on overall access costs; and

- For signalling in particular costs were driven by the complexity of UK requirements and norms of working.

Evidence was provided that this work is now being used to effectively challenge and change Network Rail's approach to Asset Management as part of an effective monitoring and review regime.

9 PAS 55 Certification

As part of the 2011 assessment, AMCL awarded Network Rail a conditional certification to PAS 55 but identified two major and 16 minor non-conformances. The conditional certification was awarded to Network Rail based on the understanding that the two major non-conformances, which both had rectification plans in place, were resolved prior to the SBP being issued. Progress against these is summarised below:

1. We reported that Network Rail had not demonstrated a clear 'line of sight' from its Asset Management Policy, Strategy and Route AMPS through to work delivery on the ground. It was anticipated that this major non-conformance could be resolved prior to publication of the SBP and its associated support documentation.

   Progress – Network Rail has demonstrated further development in its 'line of sight', specifically with the development of the Systems, Process and Monitoring document and the strategic planning framework and associated processes. In order to close this non-conformance, it will be necessary for Network Rail to demonstrate that the 'line of sight' is effective when the SBP and Route AMPs are produced and that this plan is demonstrably followed by the Routes. **This non-conformance remains open.**

2. We reported that Network Rail had not yet demonstrated that its asset information is fit for the purpose of supporting its Asset Management System decision-making requirements. It was anticipated that this major non-conformance should be rectified once the 'Data Quality Assessment Report' is published and its relationship to Network Rail's overall Asset information Strategy is properly demonstrated and understood

   Progress – The 'Data Quality Assessment Report' has now been reviewed and it provides an assessment of Network Rail's position with respect to data and information which addressed the major non-conformance. However it also contains recommendations and a plan of action for the rectification of issues under the ORBIS strategy which shows that the data and information is still not fit for purpose, but because the processes are in place to manage this, **the non-conformance remains open,** but is reduced to a 'minor' status.

The minor non-conformances were not reviewed as part of this mandate.

10 Review of Roadmap and Trajectory to 2014

As reported in the 2011 assessment report, being behind the AMCL Roadmap trajectory for the IIP in a number of key areas is likely to make achieving the SBP and end of CP4 trajectory more challenging and strong leadership from Network Rail's senior team would be crucial in ensuring a constancy of approach to delivery of the AMIP. Since that assessment, Network Rail has made good progress in continuing to deliver improvements in its Asset Management capability but there are some significant challenges ahead if Network Rail is to achieve the end of CP4 targets in all 23 Activities.

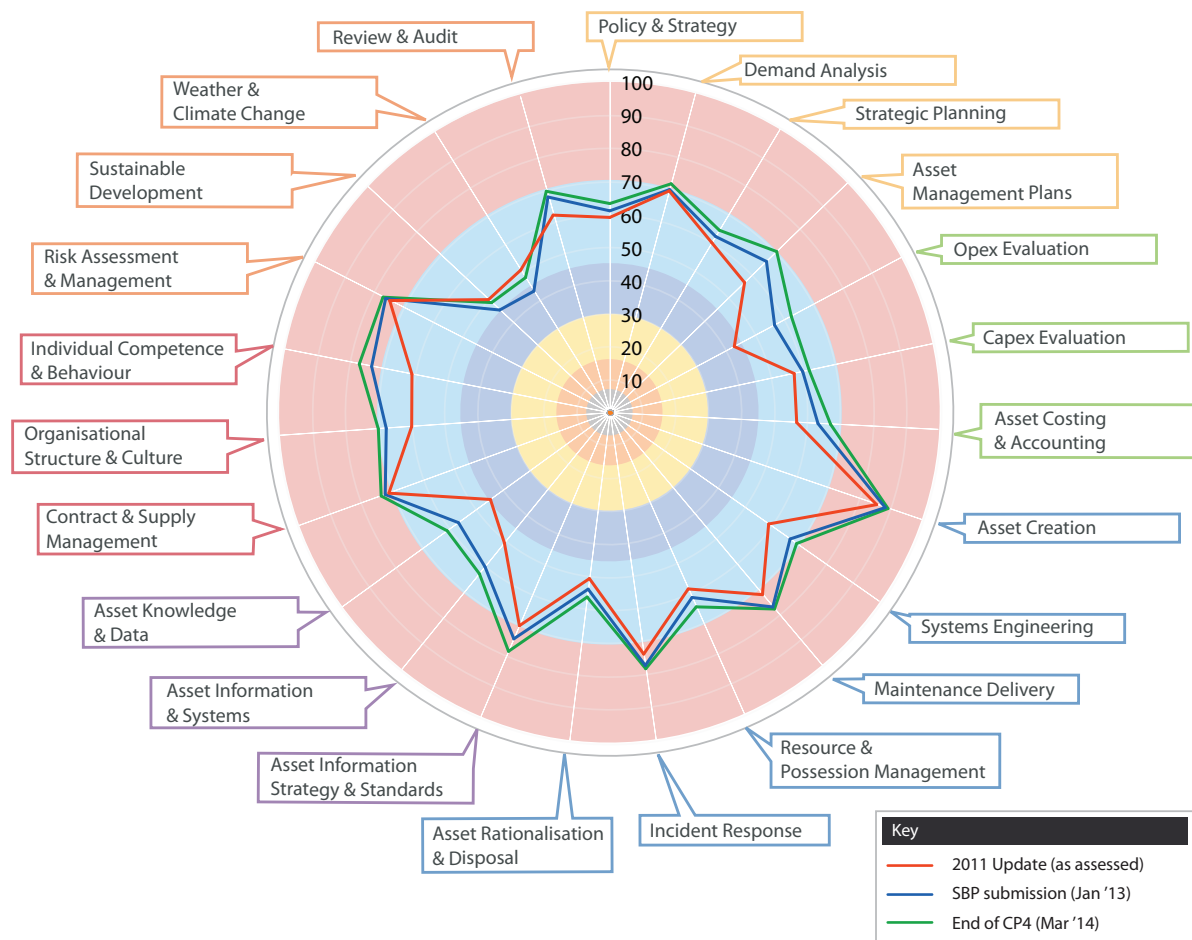Diagram 7 shows the 2011 update scores alongside the Roadmap trajectory for the SBP submission and the end of CP4.

Diagram 7: Summary of AMEM scores

In parallel to this assessment update, AMCL has been revising the Roadmap to clarify the improvement activities that Network Rail will need to undertake to address both the recommendations in this report and to achieve the capability maturity targets by the end of CP4. By the end of March 2012, Network Rail has committed to update its AMIP to align with the activities defined in this updated Roadmap and to deliver its own goal;

'…to achieve a level of asset management maturity that is at least as good as the best comparable organisations in the UK by the start of CP5'.

AMCL will continue to monitor Network Rail's progress in develop its AMIP as part of its regular Independent Reporter activities.

11 Recommendations

The following table contains the reference from the recommendations made in the 2011 assessment, a commentary on the progress made to date, and updated recommendations where Network Rail has made progress.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
1	Activity not assessed - recommendation remains	1	It is recommended that Network Rail should develop the System, Process and Monitoring Document as described in the Asset Management Policy as part of the route devolution handbook. This document should clearly define the scope of Network Rail's Asset Management System and how it meets each of the requirements of PAS 55.
2	Activity not assessed - recommendation remains	2	It is recommended that the next version of Network Rail's Asset Management Policy should include: • The additional statements of principle; • Explicit reference to other corporate policies and strategies; and • Clearly defined consistent terminology for all aspects of the Asset Management System.
3	Activity not assessed - recommendation remains	3	It is recommended that Network Rail defines criteria against which the Asset Management Policy will be evaluated.
4	Activity not assessed - recommendation remains	4	It is recommended that the next version of Network Rail's Asset Management Strategy should include: • A better explanation of how the Asset Management Strategy has taken account of the principles in the Asset Management Policy and the linkage between these principles and the objectives in the Asset Management Strategy • The inclusion of measureable Asset Management objectives in the Asset Management Strategy and better referencing to show how these objectives link to the asset discipline specific objectives in the Asset Policies; and • A more detailed strategic planning framework or reference to such a framework.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
5	Activity not assessed - recommendation remains	5	Network Rail should further develop the section on Asset Management in the 2011/12 Corporate Responsibility Report to address all the success criteria defined in the AMCL Roadmap and should more clearly articulate how effective Asset Management is integral to delivering the goals of a sustainable railway.
6	Route specifications have now been published but further developments required to support the SBP submission - recommendation updated	6	Route Specifications should be further developed to include: 1. Target infrastructure minutes delay 2. Capacity requirements of the infrastructure including headway and timetable 3. Required capability of the infrastructure including gauge, line speed and bridge strength 4. Infrastructure availability including allowance for possessions
7	Draft strategic planning framework is now in place - recommendation updated to reflect progress made	7	The strategic Asset Management planning framework should be further developed to include: 1. Clear alignment with the Systems, Process and Monitoring document showing 'line of sight' from SBP to Asset Policies, Route AMPs and Delivery Plans 2. An explanation of how the difference processes, asset information and models are linked to produce these documents. 3. A RACI showing the split of responsbilibities between the Centre and the Route and how this changes over time
8	An initial QRA was undertaken as part of the IIP submission - recommendation updated to refect furhter work required for SBP	8	Network Rail should further develop the QRA analysis to include the following as part of the SBP submission: 1. Target level of confidence to reflect the criticality of the different activities and asset types 2. The levels of confidence in the Asset Information, Asset Policies and Units Costs used to produce the Strategic Asset Management Plan 3. Confidence levels in work volumes and costs (including efficiency assumptions) over CP5 reflecting the levels of confidence in the Asset Information, Asset Policies and Unit Costs 4. Sensitivity Analysis showing the greatest contributors to uncertainty in work volumes and costs over CP5 5. An estimate of the confidence levels in both work volumes and costs in CP5
9	Activity assessed but no update to Delivery Plans since 2011 assessment - therefore recommendation remains open	9	Network Rail should include work volumes for all key activities in its ongoing CP4 and CP5 Delivery Plans and Updates and provide an explanation of why the work volumes have changed between the different plans.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
10	Activity not assessed - recommendation remains open	10	Network Rail should develop a common definition of asset disciplines in its Asset Management Strategy and all Asset Management documentation should be developed in accordance with this or clear justification provided where this is not possible
11	Activity assessed and recommendation updated to reflect the process Network Rail is putting in place to address top-down and bottom-up rationalisation	11	Network Rail should develop and implement a process for rationalising any differences between the work volumes and costs produced from 'top-down' modelling and those produced from 'bottom-up' workbanks including changes to process, asset information and models where appropriate.
12	Activity assessed and recommendation updated to reflect the new Route AMP template and to rationalise into a single recommendation for Route AMPs	12	Network Rail should further develop the Route AMPs to align with the new template and to address the specific requirements in the Asset Management Roadmap in time for the SBP submission
13	Activity assessed and now covered by recommendation 12	n/a	None
14	Activity assessed and now covered by recommendation 12	n/a	None
15	Activity assessed and now covered by recommendation 12	n/a	None
16	Activity assessed and now covered by recommendation 12	n/a	None
17	Activity assessed but this recommendation has not yet been addressed - recommendation remains	13	Network Rail should provide an analysis of the actual remaining life of the Track assets annually and compare this to the projections of remaining life that were produced as part of the justification for the 2010 Track Asset Policy.
18	Activity assessed but this recommendation has not yet been addressed - recommendation remains	14	Network Rail should develop business cases for rail management initiatives to demonstrate their long-term value for money.
19	This has now been addressed in the September 2011 issue of the Track Asset Policy - recommendation closed	n/a	None

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
20	Recommendation updated to reflect changes made in the September 2011 Asset Policies and rationalised into a single recommendation for Asset Policies	15	Network Rail should further develop its Asset Policies to address the proposals made by AMCL and Arup in the assessment of the September 2011 Asset Policies in time for the SBP submission and to include greater clarity on the way in which Asset Policies are to be deployed in the devolved Routes
21	Recommendation updated to reflect early development of Network Rail Maintenance Strategy and rationalisation into a single recommendation for developing its maintenance strategy	16	Network Rail should further develop its maintenance strategy to describe its approach to determining risk based planned maintenance, minimum action and inspection interventions for all asset groups, including the contribution Intelligent Infrastructure and remote condition monitoring could make.
22	Activity assessed and is now covered by recommendation 14	n/a	None
23	This recommendation has been partially addressed in the September 2011 Signals Asset Policy ubt still not fully quantified	17	Network Rail should review the method of assessing asset criticality for signalling to establish a quantified ranking or categorisation of critical assets.
24	Activity assessed and is now covered by recommendation 15	n/a	None
25	Activity assessed and is now covered by recommendation 16	n/a	None
26	Activity assessed and is now covered by recommendation 16	n/a	None
27	Activity assessed and is now covered by recommendation 15	n/a	None
28	Activity assessed and is now covered by recommendation 16	n/a	None
29	Activity assessed and is now covered by recommendation 16	n/a	None
30	Activity assessed and is now covered by recommendation 15	n/a	None

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
31	Activity assessed and is now covered by recommendation 15	n/a	None
32	Activity not assessed - recommendation remains	18	Network Rail should look to extend the rigorous process developed for the non-Track asset disciplines and apply this approach to renewals unit costing for Track.
33	Activity not assessed - recommendation remains	19	Network Rail should instigate processes to more accurately record costs elements associated with plant, materials and labour only sub-contractors and to then include them in calculation of MUCs.
34	Activity not assessed - recommendation remains	20	Network Rail should define its overall programme and project management requirements in a way that all disciplines can use. Ideally, this will combine the best elements of GRIP and the E2E process, plus appropriate external best practice, into a scalable programme and project management methodology.
35	Activity not assessed - recommendation remains	21	Network Rail should ensure all GRIP documentation is current and aligns with existing derogations (currently the E2E process).
36	Activity not assessed - recommendation remains	22	Network Rail should focus on the process of hand back, ensuring that clear guidelines and management support are allocated to it, ensuring that the revised processes introduced earlier in 2011 are fully embedded and demonstrably effective.
37	Activity not assessed - recommendation remains	23	Network Rail should consider establishing whether best practice approaches for the planning and implementation of maintenance and inspection activities from its Signalling, Track and E&P disciplines can be utilised within Telecoms.
38	Activity not assessed - recommendation remains	24	Network Rail should continue to investigate further the use of handheld devices to manage maintenance and inspection activities for all disciplines.
39	Activity not assessed - recommendation remains	25	Where they do not exist, Network Rail should consider establishing clearer guidelines on what to do if maintenance or inspection activities are missed, utilising a pre-defined set of risk-based criteria.
40	Activity not assessed - recommendation remains	26	Network Rail should include the requirement to assess potential for rationalisation as part of the Route AMP development process including an assessment of trade-off between operational flexibility, performance risk, and whole life costs of ownership of the assets.
41	Recommendation closed against the ORR's mandate on independent review of Network Rail's AIS	n/a	None

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
42	Recommendation not necessary as this review is already being covered by ORR and ARUP work	n/a	None
43	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	27	It is recommended that Network Rail ensures that the outputs of the developing asset stewardship condition grading approach are captured and managed in a corporate system.
44	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	28	A detailed review should be undertaken of Network Rail's strategy to improve root cause analysis and capture as part of the review of the AIS including any proposed changes to FMS and its associated processes
45	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	29	Network Rail should develop a business case for integrating Asset Data, Asset Failure & Asset Performance systems.
46	Activity assessed and Business Impact Assessments evidenced for some recent system changes or developments but no systematic approach to gap analysis, filling and communication - recommendation remains	30	A review, gap analysis and development process should be undertaken to ensure that validated business continuity plans exist across the organisation and that all relevant staff know how these plans apply to them.
47	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	31	A detailed review of the suitability and effective utilisation of document management systems in Network Rail should be undertaken to assure they appropriately support all relevant Asset Management activities.
48	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	32	Network Rail should establish a formal training regime for system users based on business requirements and good practice approaches.
49	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	33	Network Rail should establish the cost-benefits case for AVI and its integration with relevant systems to support Asset Management activities.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
50	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	34	Network Rail should provide transparency of plans for the future management of the Track Geometry Reporting system.
51	Recommendation closed against the ORR's mandate on independent review of Network Rail's AIS	n/a	None
52	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	35	Network Rail should establish a formal data archiving approach across all systems and data in accordance with relevant business objectives.
53	Activity assessed but formal independent review not undertaken as part of this update - recommendation remains	36	An independent review of the effectiveness of the 'bridging' database between CARRS and AMIS should be undertaken to assure the suitability of the approach.
54	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	37	Network Rail should include a comprehensive review of housekeeping routines as part of the initiative to replace the CARRS system and supporting Asset Management processes.
55	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	38	An independent review should be undertaken to assess how well asset data from Signalling and Track systems can be integrated to support the 'managing S&C as a system' initiative
56	Activity assessed but this recommendation was not addressed by the further evidence in this update - recommendation remains	39	Network Rail should establish an appropriate approach for the collation and management of electrification capacity and load data to support all relevant Asset Management activities.
57	Activity not assessed - recommendation remains	40	Network Rail should undertake an review of all the relevant Asset Management competence frameworks and produce guidance to ensure consistency of approach, style and level of detail, and to evaluate the completeness of coverage and appropriateness of overlaps. This will provide the basis for developing systematic and consistent processes for recruitment and selection, professional development, career planning and succession planning.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
58	Activity not assessed - recommendation remains	41	Network Rail should develop and deliver an induction and training programme for people in asset management roles at all levels. Asset management competence requirements should be used to define the learning outcomes and assessment methods used in the training programme.
59	Activity not assessed - recommendation remains	42	Network Rail should define the organisational culture(s) needed to support the achievement of the corporate strategy and objectives. These should include, but not be limited to, the values the organisation would like its staff to hold, the behaviours it wants to encourage, and the approaches to work it wants staff to adopt. Where acceptable sub-cultures are identified, the nature of these differences and the rationale for their existence should be made explicit.
60	Activity not assessed - recommendation remains	43	Network Rail should identify the gaps between the desired culture and the current culture, identify what actions the organisation can take to close these, and design a change management programme and migration strategy that takes into account the 5 – 10 year timeframe required for such a change. The analysis and design work should be completed and communicated before the devolution process to reduce the risks to the organisational culture. The culture change programme should be rolled out simultaneously in all the routes.
61	Activity not assessed - recommendation remains	44	Network Rail should review the approach being taken to the specification of service level agreements and performance indicators for individual contracts to ensure they are aligned with the Asset Management Strategy and fit for the purpose of monitoring and improving supplier performance. Network Rail should use these findings to define guidance and training for relevant staff.
62	The revised Level 2 standard is now in place and there is evidence that the new approach to risk management is being implemented. However the recommendation remains open and has been refined to be more specific.	45	The Risk Management Framework is effectively integrated into the Asset Management System, ensuring that risk management is clearly linked to the achievement of Network Rail's Asset Management objectives, that Asset Policies and DSTs are used to manage to an acceptable level the risks identified through the implementation of the Risk Management Framework, that the identification, assessment and migration of all Asset Management delivery risks is completed in accordance with the Risk Management Framework, and that the risks identified and managed through the above are fed into the Asset Management System review.
63	Activity not assessed - recommendation remains	46	Network Rail should develop an internal Sustainability Strategy aligned to its Sustainability Policy which has a single person, or body, accountable for its delivery. This Sustainability Strategy should clearly set out the requirements for delivery of the Roadmap capabilities.

2011 Rec No.	Update Findings	Update Rec No	New Recommendation Text
64	Activity not assessed - recommendation remains	47	Network Rail should clearly demonstrate the link between its understanding of climate change adaptation requirements and its discipline-specific Asset Policies, ensuring the 'line of sight' from one to the other is demonstrable.
65	The Asset Management System is under development, but this has not yet been fully developed.	48	Network Rail should ensure its Asset Management System is fully developed, and should set up a management review cycle that meets the requirements of PAS 55 Clause 4.7 with the Asset Management System as the focus.
66	The development of the 'Asset Management System' and the imminent development of a revised Assurance Framework will include the requirements to audit the Asset Management System.	49	Under the new Assurance Framework the NCAP (or equivalent) is enhanced with the following requirements: 1. Audit plans which are defined by the requirements of the Asset Management System. 2. The audit plan should be risk-based and delivered by people independent from the audited activities. 3. The plan should include sufficient cross-functional audits to ensure integration of the Asset Management System.
67	The Engineering standard is in the process of being implemented and will be in place by March 2012. The recommendation has been updated to reflect current position.	50	The current revision to the Engineering Verification standard is completed and takes into account the impact of devolution. The Engineering Verification standard is implemented with sufficient resources to ensure it will be provide assurance that the expected outputs from the Asset Management System are delivered, including: • safety related issues • asset condition and reliability • quality of work undertaken • level of defects • non-compliance with standards or other requirements
68	Being addressed through the update of the AMCL Roadmap and Network Rail AMIP - therefore recommendation closed	n/a	None
69	Being addressed through the update of the AMCL Roadmap and Network Rail AMIP - therefore recommendation closed	n/a	None
70	Being addressed through the update of the AMCL Roadmap and Network Rail AMIP - therefore recommendation closed	n/a	None

Table 9: AMEM Update Recommendations

Appendix A

Interviewees
Andrew Newby
Andy Doherty
Kevin Robertshaw
Tim Kersley
Dave Wynne
Mark Sexton
Andy Jones
Andy Kirwan
Eliane Aalgard
Tim Kersley
Andy Kirwan
Karen Reynolds
Patrick Bossert
Calvin Lloyd
Giles Tottem
Mike Howard
Glen Garrard
Ian Tankard
Martin Tiller
Steve Hobden
John Halsall
Stephen Sutcliffe

Appendix B

AMCL Unique Reference	Evidence
NR11U-1	PR13 Supporting Document International Bottom up Maintenance and Renewal Railway Benchmarking: Update November 2011 DRAFT
NR11U-2	ORR & Network Rail Mandate AO/015: NR Bottom Benchmarking Programme Audit Final Report Version 1.1	January 2012
NR11U-3	Periodic Review 2013 Progressive Assurance Process Network Rail's Efficiency Assumptions in IIP
NR11U-4	ORR – Embedded Efficiency Assumptions Paper V 2
NR11U-5	Periodic Review 2013 Progressive Assurance Process CP5 Maintenance and Renewal Scope and Unit Cost Efficiencies: summary and progress report
NR11U-6	Copy of Research projects 2011 (New Format)
NR11U-7	SE_University Research 2011
NR11U-8	Asset Management Framework 020212 (Power Point Presentation)
NR11U-9	ASI Introduction and 2009-10 Performance
NR11U-10	ASI trends to support target setting for 2011-12
NR11U-11	Mandate AO/015 Network rail bottom Up benchmarking programme Audit – Final report v1.1 Jan 2012 (ARUP)
NR11U-12	PR13 Supporting Document: Internal Bottom Up maintenance and Renewal – Railway
NR11U-13	IRM Risk Triangles Guidance July 2011
NR11U-14	M&E Asset Risk Triangle
NR11U-15	Non-structural asset risk failure Triangle
NR11U-16	Structural Asset Risk Failure Triangle
NR11U-17	Audit Risk Committee Terms of Reference
NR11U-18	Copy of IRM PMP 16 9 11
NR11U-19	Asset Management Framework 020212
NR11U-20	Form TEF 3075 - NR/L2/TRK/001 Appendix A - Proposal to reduce Basic Visual Inspection frequency - Record of decisions taken

AMCL Unique Reference	Evidence
NR11U-21	Ellipse Official Design Document Detailed Design - Switches and Crossings (S&C) – Version 1.2 Appendix A
NR11U-22	Ellipse Official Design Document Detailed Design - Switches and Crossings (S&C) – Version 1.2 Appendix B
NR11U-23	Ellipse Official Design Document Detailed Design - Switches and Crossings (S&C) – Version 1.2 Appendix C
NR11U-24	Ellipse Official Design Document Detailed Design - Switches and Crossings (S& C) Append ix D – Old to New EGI Mapping (V1.2 Issue)
NR11U-25	Table A.4 Risk Assessment for reduction in basic visual track inspection frequencies for CWR plain line only
NR11U-26	Lambrigg Rec 2 Predict & Prevent Workshop (slides) 11/7/11
NR11U-27	Form TEF 3091 V2. Approval of reduction in visual inspection frequency certificate. Dec 2010
NR11U-28	Track Systems Principles. NR/L2/TRK/001/mod1. Issue 5 draft 1
NR11U-29	Track Systems Principles. NR/L2/TRK/001/mod1. Issue 6