Department of Transport
An Roinn Iompair

Value for Money Review

Of

The Railway Safety Programme 2004 - 2008

December 2008

This document, together with the report prepared by Risk Solutions and overseen by the Review Steering Committee, comprises the Value for Money Review of Iarnród Éireann's Railway Safety Programme 2004 – 2008, undertaken by the Department of Transport under the VFM and Policy Review Initiative.

Introduction

1.1 This is the report of the Steering Committee established to manage the conduct of a Value-for-Money Review of the Second Railway Safety Programme (RSP) 2004 – 2008. Together with the attached technical report by Risk Solutions – *Value for Money Review of Irish Rail's Second Railway Safety Programme* – it forms the Expenditure Review carried out under the Department of Finance's Value for Money and Policy Review Initiative, as part of the 2006 – 2008 round of reviews. Under that initiative, the VFM review is to be completed by end-2008. The Review Steering Committee is chaired by the Department of Transport and comprises officials of that Department's Internal Audit Unit, Finance Unit, Railway Safety Division, as well as representatives of the Department of Finance, the Railway Safety Commission and Iarnród Éireann.[1] Full membership of the Steering Committee is included at Appendix 1 to this report.

1.2 Having agreed terms of reference for the review, the Steering Committee selected consultants Risk Solutions in February 2008 to carry out the review. In accordance with the guidelines issued by the Department of Finance for the conduct of VFM studies, the consultants' methodology for the review was agreed by the Steering Committee and reviewed at various stages. The consultants worked with the Railway Safety Division of the Department of Transport throughout the information gathering and analysis stages of the review and presented emerging findings to the Steering Committee at a series of meetings at which the Committee also endorsed next steps proposed by the consultants. A draft final report was prepared by the consultants in August 2008 and, following detailed review by the Steering Committee, the final report was presented to the Department on 24 October 2008.

1.3 The draft final report, along with the Steering Committee's "overview" report, was submitted for external evaluation by Petrus Consulting in November 2008. The external evaluator identified some issues with the report and consequently the Steering Committee asked the consultants to carry out some further work (see para 6.1 below). The report was finalised in December 2008.

Railway Safety Programme 2004 – 2008: Background

2.1 The purpose of the Railway Safety Programme is to improve all aspects of safety across the Iarnród Éireann network and to maintain levels of risk as low as is reasonably practicable. The programme's objectives were to:

- Ensure the continued safe operation of the network
- Bring physical assets to the appropriate standards from a safety perspective
- Take due account of the effect of projected growth and development of railway services
- Identify, assess and control the risks to the health and safety of passengers, public, employees and contractors

[1] Iarnród Eireann representatives on the Committee are non-voting members.

- Manage and reduce the level of risk associated with railway operations
- Develop further the preventative maintenance approach to the management of assets.

The programme is 100% funded by the Exchequer.

2.2 Following a passenger train derailment in 1997, concern for the safety of the rail network led to a major review of rail safety, carried out in 1998 by independent rail consultants, International Risk Management Services (IRMS). At the time, the Minister for Public Enterprise, with the approval of the Government, established a high-level Task Force to examine and address the safety issues identified in the IRMS report. The Task Force recommended the implementation of three successive five-year railway safety programmes addressing the highest risks on the network first and focusing on reducing risk and thus improving safety. This recommendation was accepted by Government in its decision of 3 November 1998.

2.3 The first programme (1999 – 2003) resulted in expenditure of €661 million, the bulk of which was on infrastructural safety investment but also addressed safety management systems within Iarnród Éireann.

2.4 The 'second' railway safety investment programme is being implemented over the period 2004 to 2008 and is the subject of this VFM review. The programme continues the strategy of the first Railway Safety Programme assisted by an enhanced Risk Model developed by Iarnród Éireann to assess various factors contributing to risk, such as the condition of the network assets, level of services and management systems. While the programme consists of an agreed programme of works, it accommodates the necessary flexibility to manage risks as they become apparent. The programme involves a total investment of €512m. €444m was allocated for infrastructure renewal in order to continue improvement work on track, fencing, level crossings, bridges, safety critical buildings, signalling & telecommunications, and on cuttings and embankments. A feature of the programme is a much greater emphasis on enhancing the safety culture and safety management systems of the company and €68m approximately of the overall budget of €512m. was allocated for those purposes. Safety training across the organisation is an important element of this aspect of the investment, as well as the development and enhancement of tools such as an Infrastructure Asset Management database, which in turn feeds into the Risk Model.

Railway Safety Programme 2004 – 2008: Policy Context

3.1 The report of the Task Force established to develop the second RSP placed its recommendations within the context of Government policy on transport at the time. It acknowledged that up to 1998 there had been little investment in public transport for a number of decades and that the first and second Railway Safety Programmes represented a structured effort to address a significant investment backlog in the railway network. It noted the key government priority since 1998 to develop and upgrade the public transport system to provide a real alternative to the private car. Investment in the railways since then had focused on safety and increasing the passenger carrying capacity of the system – rail passenger numbers had increased from 31.7 million in 2001 to 35.5 million in 2003. However, it also noted that increased frequency of services and additional passengers adds to the overall risk exposure on the network, and considered this in the context of the findings of the *Strategic Rail Review (Booz Allen Hamilton, 2003)* that "rail in Ireland, in particular passenger rail services, should have a sound and sustainable future. Very real opportunities exist to significantly grow the market and increase rail market's share even in an increasingly competitive environment".

3.2 Government transport policy was also reflected in decisions of the Task Force concerning the detail of the programme. In particular, the Task Force agreed that the programme would be prepared on the technical assumption that the existing network and pattern of services would continue, and also taking account of planned growth in service frequencies and passenger numbers. This included the understanding that lightly-used lines (Ballybrophy to Killonan Junction, Limerick Junction to Waterford and Waterford to Rosslare Strand) would continue to be operational, despite the fact that these lines were uneconomic. In the final analysis, the Task Force agreed that continuing expenditure of a safety related nature on these lines was unavoidable as long as the three lines in question remained in operation consistent with government policy to develop public transport services.

3.3 In relation to the cost evaluation of the programme, the Task Force also emphasised that "most rail investment cannot be justified on financial grounds alone, but has to be considered in a wider socio-economic, safety and environmental context". In overall economic terms, the ex-ante economic evaluation of the programme demonstrated that the investment would be justified if the predicted level of risk reduction and operational benefits were achieved. Investment for bridges, buffers, fencing, level crossing and cuttings & embankments was considered to be justified on safety grounds alone, whereas funding for points and crossings, signals and all track expenditure was considered to be justified only when operational benefits were added to the safety benefits. The predicted safety benefits were based on outputs from a Risk Model which was in an early stage of development at that time. Subsequent enhancement of this Risk Model revealed that the ex-ante evaluation took an overly cautious view of risk and hence the safety benefits had been overestimated.

3.4 The Task Force agreed that particular attention should be given to the safety culture and management aspects of the overall safety programme and that this would have to include funding for the recruitment of certain posts. It was considered that a failure to fund these staffing costs would reduce the return from the infrastructure investment. However, it was recognised that such staff costs should not in the longer term continue to be a charge on the Safety Programme and the Task Force proposed that capital funding for this element should cease by end 2008.

Main Findings of the Review Conducted by Risk Solutions

4.1 The Executive Summary of the Risk Solutions' report sets out the main findings and recommendations of the VFM Review. Chapter 7 of the report also sets out main conclusions and recommendations, while detailed findings are included in the summary sections of Chapter 3 (Safety Management System Investment), Chapter 4 (Infrastructure Investment) and Chapter 6 (Programme Monitoring).

In summary, the review:

- found that the safety benefits originally projected based on the 2003 Risk Model will not be achieved. This Risk Model was at an early stage of development in 2003 and cautious assumptions about risk were made at that time. With the benefit of more detailed information and incident data, a recalibrated model suggests the planned programme of works should have projected lower benefits in terms of risk reduction.. However, because IE has achieved an overall increase in the volumes of work, actual benefits exceed the projected benefits based on the <u>recalibrated</u> model;

- concludes that the programme objectives in relation to projected outputs were broadly met. Planned infrastructure outputs were exceeded in a number of areas including track relaying, fencing, building repairs and level-crossing works. However, outputs will be less than planned in areas such as ballast-cleaning, tunnel repairs and handrail installation;

- concludes that the cost of the work delivered is generally economically efficient, by comparing unit costs between IE Divisions, to the planned programme of work and to external comparators, although some anomalies exist between IE Divisions;

- identified delays in the appointment of safety auditors and accident investigators;

- found that some measures (viz. the confidential reporting system CARA and Internal Safety Surveys have been dropped and that others (eg. Synergi accident reporting database) proved unsuccessful and had to be replaced;

- concludes that the management and monitoring of the programme would have benefitted from the appointment of a Safety Programme Coordinator, better specification of planned outputs and outcomes, and mechanisms to continuously assess the safety benefits being delivered as the programme progressed;

- concludes that indicators for the programme should also have included any operational and other benefits resulting from the programme, as well as for monitoring intolerable risks;

- concludes that there has been a sustained improvement in the level of safety performance, with recorded data against key safety indicators demonstrating notable reductions in the numbers of signals passed at danger (SPADs), train-train collisions, collisions with large animals, derailments in sidings, passenger slips, trips and falls, and staff lost-time accidents;

- found that in strict cost benefit terms, the safety dividend was less than the cost of the investment. The benefit-cost ratio is improved when the beneficial impact on journey times are taken into account, but combined benefits are still exceeded by the costs and therefore do not ultimately demonstrate value for money in cost-benefit terms. However, sensitivity-testing yields a cost benefit ratio greater than one in certain optimistic scenarios (see Table 3 of Executive Summary).

- concludes that investment in some aspects of the infrastructure termed "long-lived assets" (eg, bridges, embankments) rarely delivers significant safety or operational benefits but is needed to prevent degradation to the point where they represent a risk to safety, at which point the cost of repair is less economic than earlier preventative maintenance. In such cases, the decision to invest is a policy question and is justified if it is policy to continue running rail services;

- concludes that continued investment is needed to reduce risk at level crossings that still represent an "intolerable" level of risk, to repair assets that are unreliable or impose unacceptable operating constraints, to ensure long-lived assets receive preventative maintenance and to complete important changes to IE's Safety Management Systems.

Department of Transport Response to the Findings

5.1 The Department acknowledges the work carried out by the consultants in completing this body of work, as well as the work carried out within Iarnród Éireann in providing significant volumes of information and a high level of co-operation with the consultants. The Department is pleased with the consultants' application of the Department of Finance Guidelines for carrying out expenditure reviews, in particular their detailed application of the programme logic methodology advocated in the guidelines.

5.2 The Department also recognises that the process of the review was very useful for both the Department and for Iarnród Éireann, particularly in terms of building understanding of issues concerning funding safety improvements. Some key lessons have been learned that should inform the development of the third Railway Safety Programme 2009 – 2013, including the need to specifically identify and monitor the operational benefits of the investment such as journey-time and reliability benefits. The development of the Risk Model and other tools under the programme now allow for much greater level of detail regarding risk, and this information should be fully exploited in order to prioritise future investment under the third programme. The distinction between safety-critical investment and ongoing preventative maintenance also needs to be made for funding purposes, particularly with a view to funding the railway network beyond 2013.

5.3 The collaborative approach to the review allowed for some key issues to be addressed during the process: notably, initial results emerging from the Risk Model highlighted systems difficulties within Iarnród Éireann in updating information underlying the model and in integrating the Model with all relevant business functions in the company. These difficulties were addressed quickly and allowed for more accurate interpretation of safety benefits emerging from the Model. Some monitoring arrangements by the Department were also improved during the course of the review.

5.4 The policy position that informed the decision-making process by the Task Force during the development of the programme in 2003, as outlined in paragraphs 3.1 to 3.4 above, impact significantly on the outcome of the VFM review – and particularly the cost-benefit analysis aspect of the review - and it is the opinion of the Steering Committee that these need to be taken into account in the final analysis. Essentially, there was a policy choice to keep uneconomic railway lines open; in the absence of accurate information regarding risk, a cautious view was taken on levels of risk on the railway; and the commitment made to improving the safety culture in Iarnród Eireann translated into significant investment in areas where return on investment would be long-term and difficult to quantify. This included investment in the Safety Management Systems of Iarnród Eireann which are required to manage safety better in the future and the benefits of which are difficult to quantify. It also included investment in lightly-used lines to reduce risk to a tolerable level – the consultants point out that the benefit-cost ratio on such lines would have been low and "hence will have diluted the overall benefit-cost ratio for RSPs". Finally, the investment in long-lived assets is a cost-effective measure to ensure the asset does not present future problems and costs, but does not deliver immediate benefits on a scale that would impact on the benefit-cost ratio.

5.5 It should be noted that the Terms of Reference for the review did not include a requirement for the consultants to consider the current validity of the programme objectives and their compatibility with the overall strategy of the Department. In this respect, paragraphs 3.1 to 3.4 of this report address the policy context of the programme's inception and rationale. The Steering Committee notes that Government policy on railway safety has not changed since 2003 when the Second Railway Safety Programme was developed. The Government's *Programme for Government 2007 – 2012* states current Government policy to be the implementation "under *Transport 21* of a programme of investment and service development" that will "improve safety" (among the five major objectives for the transport sector). *Transport 21,* the Government's ten-year prioritised capital investment programme, renews the commitment, under the 1998 Government Decision, to the continuation of the Railway Safety Programme. The mandate given by *Programme for Government 2007 – 2012* is reflected in The Department of Transport's *Statement of Strategy 2008 – 2010* and the high-level goal "to ensure that transport infrastructure and services are provided, regulated, secured, managed and used in a manner that protects people from death and injury". The strategies for delivering this goal include to "promote, oversee, monitor and support the effective implementation of a prioritised safety investment programme for the improvement of railway safety management systems and infrastructure".

5.6 The Railway Safety Programme's objectives relate primarily to the safe operation of the network, the safety of the physical assets and the identification, management and reduction of risk. An additional objective is to "take due account of the effect of projected growth and development of railway services", which is also being promoted by Government through the *Transport 21* programme. Finally, the objective to "develop further the preventative maintenance approach to the management of assets" is consistent with the Department's policy of sustainable development that "is aimed to contribute now and in the future to economic growth, social cohesion and the protection of the environment" (*Statement of Strategy 2008 – 2012).*

5.7 Furthermore, it should be noted that key elements of the investment – for example, the development of the Safety Case and the establishment of an incident investigation/audit team - were targeted at achieving compliance with EU and government policy on railway safety as promulgated through the Railway Safety Directive 2004 and the Railway Safety Act 2005. Many aspects of the Safety Management Systems being developed under the Railway Safety Programme, while being driven by the objective to reduce risk, must also achieve compliance with EU rules on standards and procedures to promote the harmonisation of railway management and operation across Europe.

External Evaluation

6.1 Petrus Consulting was engaged by the Department to conduct an external evaluation of the VFM Review. The external evaluator made a number of recommendations for improvements to the report which were accommodated in the final version. In particular, the external evaluator questioned the assumptions underlying the journey-time benefits in the cost-benefit analysis. Consequently, the cost-benefit evaluation was re-run using more conservative assumptions on journey-time benefits The external evaluator also queried the use by the consultants of a 0.1% discount factor for sensitivity testing the evaluation of safety benefits (as opposed to other benefits). The Department sought the views of the Economic Evaluation Unit of the European Railway Agency, which informally advised that a low discount rate for the evaluation of safety-related benefits is accepted in other jurisdictions for the health and transport sectors but that 0.1% was very low. Consequently, a 1% discount rate was used as a sensitivity-test for the analysis. The effect of these changes was a deterioration in the benefit-cost ratio, with costs of the programme exceeding the benefits except where an optimistic view is taken of journey-time benefits and where a 1% discount rate for safety benefits valuation is used. (see Table 3 of Executive Summary).

Steering Committee Recommendations to Task Force Developing Railway Safety Programme 2009 – 2013.

7.1 The Steering Committee agrees with the findings and recommendations of the consultants' report, and notes that the timing of the report is opportune in that the Task Force for the Railway Safety Programme 2009 – 2013 has recently been convened. In that context, the Steering Committee advises that the Task Force should confirm that all recommendations in the VFM report relevant to the Task Force are addressed in its deliberations. Accepting that the work of the Task Force is primarily to address risks to safety on the railway network, the Steering Committee nonetheless suggests that a much greater emphasis should be placed in the next programme on the wider economic evaluation of investment and including an assessment of operational impacts. Now that the Risk Model has been developed to a high level, a more detailed economic evaluation of each element of the programme should be possible.

7.2 The Task Force should also look to prioritising investment in areas where the return on the investment, primarily in terms of the net present value of risk reduction, is greatest. The VFM review found, for example, that the safety benefits from the removal, upgrade and refurbishment of level crossings is responsible for most of the safety benefits attributable to the programme, and that this aspect of the programme also returned the best cost-benefit ratio (for safety benefits). For the third Railway Safety Programme, the new Level Crossing Risk Model, incorporating more detailed data on level crossing risk, should be used to validate this finding and inform future prioritisation of level crossing improvements.

7.2 The Steering Committee also recommends that a clear distinction be drawn in the next programme between "renewals" and ongoing necessary "maintenance", particularly in relation to investing in long-lived asset works. The next programme should concentrate on eliminating or mitigating the highest risks in the first instance, particularly in relation to level crossings.

7.3 Despite the previous Task Force's stipulation that staff costs should cease to be funded beyond 2009, the Steering Committee suggests that serious consideration be given to the review's recommendation to complete a number of key activities under the Safety Management Systems category of expenditure. Acceptance of this recommendation would involve funding some staff costs in the shorter term.

7.4 Finally, the Steering Committee recommends that Iarnród Éireann reports to the Department by end-January 2009 on progress made in closing out the Railway Safety Programme 2004 – 2008 and in implementing the recommendations of the review in the process.

Appendix 1

Steering Committee Membership

<u>Department of Transport Members</u>:

Jim Humphreys (Chair)	Railway Safety & CIE Investment/Corporate Affairs Division
Margaret Kelly (Secretary)	Railway Safety & CIE Investment/Corporate Affairs Division
Monica Wallace (Review Manager)	Railway Safety & CIE Investment/Corporate Affairs Division
Derek McConnon	Finance Unit
Ciaran Whelan	Internal Audit Unit

<u>Department of Finance Members</u>:

Ronan Gallagher	Public Expenditure Division
Annemarie Freeman	Public Expenditure Division

Technical Expert

John Welsby	Railway Safety Commissioner

<u>Irish Rail Members</u>:*

David Graham	Financial Officer
Eileen Wilcock	Chief Civil Engineer, Infrastructure

**Irish Rail membership on collaborative basis only. Irish Rail members do not have role in agreeing/signing off drafts/reports or other decisions.*