Department of Infrastructure,
Transport, Regional Development and
Local Government

Independent Review of the
Grain Infrastructure Group’s
Freight Network Review

This report contains 108 pages
DITRDLG09-GIG Final Report

© 2009 KPMG, an Australian partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International, a Swiss cooperative. All rights reserved.
The KPMG logo and name are trademarks of KPMG.
Liability limited by a scheme approved under Professional Standards Legislation.
# Contents

1 Executive summary                   2
1.1 Introduction                      2
1.2 Key findings                      4
1.3 Way forward                       7
1.4 Investment options                7

2 Introduction                       11
2.1 Purpose of the review             11
2.2 Approach                          12
2.3 Structure of this report          14

3 WA grain industry and supply chain overview  15
3.1 Grain production                  15
3.2 Grain freight supply chain        17
3.3 Recent industry developments      22

4 Grain Infrastructure Group (GIG) Freight Network Review  25
4.1 The Grain Infrastructure Group    25
4.2 Background to the GIG review      26
4.3 Approach                          28
4.4 Key assumptions                   29
4.5 Key findings                      30
4.6 Key recommendations               31

5 Assessment of the GIG investment proposal  33
5.1 Our approach to reviewing the GIG proposal  33
5.2 Summary of results                43
5.3 Testing the GIG market share assumption  47

6 Investment options and risk analysis  54
6.1 Investment options                54
6.2 Investment option assessment and risk analysis  56

7 Proposed Implementation plan        65
7.1 Key steps                         66

A Stakeholders consulted during this review  71
B GIG costs and benefits               73
C Factors influencing our approach     74
D  GIG cost benefit analysis  
D.1 Costs  
D.2 Benefits  
D.3 Key issues  
D.4 Line by Line assessment  

E  GIG cost benefit analysis using updated data  
E.1 Line by Line assessment  

F  GIG cost and benefit analysis including all costs and benefits  
F.1 Costs  
F.2 Benefits  
F.3 Using alternative discount rates  
F.4 Including externality costs  
F.5 Testing of outcomes under likely energy price scenarios  

G  Testing the GIG cost estimates and assumptions  
G.1 Costs  
G.2 Benefits  

H  The principles of bypass  

I  Cooperative Bulk Handling  

J  Additional information  
J.1 Alternative discount rates  
J.2 Electricity industry case study  

K  Technical, cost and market analysis – SAHA International
### Disclaimer

**Inherent limitations**

This report has been prepared as outlined in section 2. The services provided in connection with this engagement comprise an advisory engagement which is not subject to Australian Auditing Standards or Australian Standards on Review or Assurance Engagements, and consequently no opinions or conclusions intended to convey assurance have been expressed.

Reference to “review” throughout this report has not been used in the context of a review in accordance with Australian Auditing Standards and Australian Standards on Review Engagement.

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by, the Department of Infrastructure, Transport, Regional Development and Local Government and stakeholders consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

KPMG is under no obligation in any circumstance to update this report, in either oral or written form, for events occurring after the report has been issued in final form.

The findings in this report have been formed on the above basis.

**Third party reliance**

This report is solely for the purpose set out in section 2 and for the Department Infrastructure, Transport, Regional Development and Local Government’s information.

This report has been prepared at the request of the Department of Infrastructure, Transport, Regional Development and Local Government in accordance with the terms of KPMG’s work order dated 13 March 2009. Other than our responsibility to the Department of Infrastructure, Transport, Regional Development and Local Government, neither KPMG nor any member or employee of KPMG undertakes responsibility arising in any way from reliance placed by a third party on this report. Any reliance placed is that party’s sole responsibility.
1 Executive summary

1.1 Introduction

The Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government (“the Department”) has engaged KPMG, in partnership with SAHA International (“SAHA”), to undertake an independent review of the Grain Infrastructure Group (“GIG’s”), Grain Freight Network Review report (“the GIG report”). The GIG report is not in the public domain.

The GIG was established in 2004 and comprises the Department of Planning and Infrastructure, Co-operative Bulk Handling (“CBH”), WestNet Rail, the Australian Railroad Group, and the Australian Wheat Board (“AWB”). The AWB is no longer a member since the removal of the single desk.

The GIG report recommends investment in the rail network to maintain its role in grain freight, funding arrangements to facilitate this investment and pricing arrangements to maintain the competitiveness of rail grain freight. While the GIG report acknowledged that the most efficient supply chain would involve the closure of several rail branch lines, the GIG recommended that, with government financial support, all lines could remain open benefiting the broader community and ensuring volumes are retained on the rail network. The GIG recommended the following funding:

- $400m over the next five years for investment in rail, road and fast rail loading infrastructure, of which about $200m would be for rail re-sleepering over 3-5 years; and
- a further $400m to upgrade local and State roads over the longer term, bringing the total farm gate to port supply chain package to $800m over the next 10 years.

Market context

WA is a major producer of wheat, barley, canola and lupins, accounting for around 41 per cent of Australia’s total winter crop in 2008-09. Grain production is projected to continue to increase despite climate change, although it will increasingly be drawn from western and southern areas of the Wheatbelt, which are generally closer to ports.

The WA grain industry is largely export oriented. Given that the majority of grain from WA is exported (historically around 10mt per annum or 80% of production, a small proportion of which is handled by container freight), the grain freight supply chain focuses on moving grain from the farm gate to one of the four ports.

WestNet Rail’s grain network in southwest WA comprises a combination of standard, dual and narrow gauge track. The 2,300km of narrow gauge track is used almost exclusively for transporting grain. The market share of rail has slowly fallen in recent years, but volumes have been maintained. Rail now accounts for around 60 per cent of grain transport from silo to port.
Off-farm supply chain costs (including farm to silo) represent up to 15% of growers’ total operating cost of production and between 14% and 26% of the total sale value.

**Purpose of our review**

To complete this review we have undertaken an independent and objective assessment of the business case for the proposed investment, and consulted with a wide variety of stakeholders. To assess the business case we have:

- identified the assumptions that are used by the GIG;
- identified the types of assumptions made and the basis for those assumptions;
- examined the materiality of those assumptions to determine those that are most critical to the conclusions drawn and recommendations made;
- tested the veracity of those assumptions and how they have been applied;
- used this analysis as a basis for drawing conclusions about the veracity of the GIG’s conclusions and recommendations and to provide advice to the Commonwealth Government on the options that exist to ensure the development of a more sustainable grain freight supply chain in Western Australia; and
- undertaken an assessment of the risks associated with these options and how they might be mitigated.

SAHA have assessed the technical, cost and market assumptions that underpin the GIG report, and we have relied upon their work in undertaking our analysis.

**Our assessment framework**

To assess the assumptions underpinning the GIG report and its conclusions, we have adopted principles consistent with those used in standard approaches to cost benefit analysis by most governments and agencies in Australia for capital business cases (e.g. by Infrastructure Australia, although this project is under the Nation Building program), including those used in the transport sector.

In our experience, these principles are also consistent with investment evaluation criteria commonly used in commercial practice, notwithstanding the different focus they involve.

Some of the key characteristics of the framework for our review are outlined below:

- Only incremental economic costs and benefits that the investment will incur or produce are considered.
- All types of economic costs and benefits are considered, including ‘external’ costs and benefits, from a “societal” or community perspective.
• It separates consideration of the investment decision from funding and pricing decisions. In other words, our review focuses in the first instance on whether the investment is justified based on the economic costs and benefits associated with the project, rather than how it might best be funded.

• Examines the market competitiveness issues in some detail to understand the factors that are driving the choices growers make in deciding whether to use rail or road freight. Market share assumptions are typically one of the most critical variables in business cases (i.e. as they typically dictate the size of the benefits), particularly where governments are seeking to intervene to influence market outcomes.

1.2 Key findings

We note that undertaking an assessment of the GIG assumptions is not a straightforward task and cannot be completed without making significant judgments and simplifying assumptions in order to make relevant and reasonable comparisons. In addition, the GIG investment package and data is now somewhat dated. With these caveats in mind, the results are as outlined below.

At an overall level, the costs of the proposed investment package are likely to significantly exceed the benefits. The results have been tested by varying the key assumptions underpinning the GIG analysis and the outcomes either do not appear to vary materially (although higher energy costs favour rail), or would appear to get materially worse. In other words, the costs of maintaining all rail lines are likely to be higher than the additional costs of having more grain freight on the roads and providing capacity to suit.

At the branch line level, the results are similar, although there is some variation between them. The uncertainty around these branch line costs and benefits are, however, particularly wide and we are not sure that of themselves they provide a reliable basis for making investment decisions.

These findings should perhaps not be surprising. Although the required investment in the rail network is incremental in that it involves maintaining existing lines, it is capital intensive and these lines reflect the historical purpose of the network. Moreover, the assets that would be renewed will not be utilised heavily (i.e. ARG currently operates up to 10 narrow gauge sets operating over a network of 2,300 kilometres). Above rail operations also involve significant fixed costs and relatively limited operational flexibility. In contrast, while upgrading roads is also capital intensive, the roads have to be there anyway, and the incremental costs imposed by using these roads to transport more grain would appear to be modest, partly because the grain freight task is dispersed at source and all grain starts its journey by road anyway. In addition, investment in above road haulage operations is less capital intensive, and those assets can be used much more flexibly and therefore intensely.

In this regard, it is also worth noting that:

• grain freight is a relatively small part of the freight task, a task which road dominates particularly in WA;
rail and road already compete heavily for grain, but rail appears to be finding it increasingly difficult to compete. For rail, grain is its primary freight product outside the main lines, whereas, for road, grain is a relatively small and seasonal part of the market; and

market developments would appear to be further threatening the competitiveness of rail and unwinding these changes is difficult (e.g. customers value greater flexibility and are requiring the supply chain to become more customer, rather than production, driven).

In overall terms, the business case to support the conclusions drawn and recommendations made by the GIG is therefore not strong. It would require placing a very high value on the external costs of greater use of roads than would appear to be justified by the available evidence.

Even with the investment package, the market share of rail is likely to fall perhaps significantly in light of changing market circumstances. These circumstances include:

Recent deregulation of the wheat market and the emergence of independent traders will encourage the market to seek the least cost paths to port or to domestic customers. The WA Department of Agriculture and Food (WADAF) estimate that around 30% of grain was sold for cash this year, which could grow to around 40% over the next few years. The more individual and direct exposure to market prices comes with the opportunity to make significant additional profit, but also the risk of losing revenues or incurring higher costs. It is reflected in demands for a change from production driven to demand driven supply chain solutions.

During our review, we were advised of efforts by some growers (supported by some traders) to explore alternative export grain options. We understand that some of these parties:

- are in discussions with port authorities and have trialled a mineral loader to see whether it could be used to load grain;

- are in discussions with a consortium to see whether their plans for a new break-bulk berth would have the functionality to load grain;

- have contacted a port authority enquiring about opportunities to secure berth space for a potential temporary grain loader;

- have begun exploring the suitability of an existing woodchip loader for loading grain; and

- have examined the option of exporting more grain via containers.

The operating environment for rail including lower payloads than road on many routes, poor track condition, deteriorating cycle times and the pressure to move greater volumes during a compressed period are reducing rail’s ability to compete on both service and price. Over time, grain production would appear to be moving to areas that are closer to port, where rail is generally less competitive.
• Road cartage is becoming increasingly competitive with greater payloads relative to rail on a number of routes, higher average speeds, increased opportunities for backloading and greater scope for deployment outside the season.

• These circumstances appear to undermine some of the fundamental premises of the GIG analysis in particular that; volumes would be retained on rail with or without line closures and CBH, through its storage and handling network and supply chain coordination, would be able to control and direct volume to rail.

In practical terms, this means the benefits of investing in the rail network are likely to be lower than envisaged, because much of the investment in road is likely to be required anyway (i.e. the business case for the investment is further undermined). In addition, there would be significant risks associated with the investment, as it is it could be made redundant by the changes that are occurring in the market more generally. There is also a risk that changes in business ownership or ownership structure might impact on the incentives of the providers of grain freight services.

‘Regulating’ grain freight to rail would appear to be the only way to mitigate the risk that the estimated benefits do not materialise (because the road investment costs are not avoided). Regulating to rail would appear to be inconsistent with the broader direction of Government policy which has been more consistent with deregulating the export of bulk grain. Given the trend toward greater deregulation of the market, this would seem to represent a step in the opposite direction. Based on our consultations with key customer groups, such a step would likely be very poorly received and may only serve to further erode grower returns.

If the Government wanted a guarantee that the tracks that were re-sleepered were not surrendered, if would need to either renegotiate the relevant lease terms or come to another agreement that overrides these terms. Even if it did so, however, it is not obvious how government could force these rail lines to be used, so the practical benefit this could provide may be limited.

In summary, in our view the GIG review does not now provide a reliable basis on which to make major investment decisions. This indicates a need for further analysis of alternative investment options in light of current market circumstances. We also appreciate that closing rail lines, particularly in the absence of other actions to support the development of a more sustainable grain freight supply chain in Western Australia, is likely to create or reinforce perceptions about the degree of support provided to rural communities.

This view is consistent with those of a broad variety of stakeholders, particularly users of grain freight services. Moreover, the proponents of the GIG also now have somewhat different plans in mind. All stakeholders share the view, however, that greater certainty is essential so that they can adequately plan for and invest (e.g. ARG in rolling stock) if rail is to be supported. The rail grain freight sector argues that it has been waiting for a decision on government support for a number of years, and a number of track closures are likely to occur in the short term in the absence of investment.

The need for greater certainty for stakeholders is consistent with recommendations of the National Transport Commission Supply Chain Pilots Draft Position Paper (March 2009).
1.3 **Way forward**

The Commonwealth Government’s key priority, at least in the context of this study, is to facilitate the development of a more sustainable grain freight supply chain in WA subject to the necessary commitment to providing investment from the WA Government, grain freight industry, growers and exporters.

The key priority recognises that:

- rail is likely to remain an important although reduced part of the grain freight task for the foreseeable future, as it provides significant capacity which in some cases would be difficult to provide by road, particularly given the expected growth in production. Rail and road can and do therefore compliment each other (as well as compete);

- there is a *prima facie* case for investing in rail to correct the ‘market failure’ created by the inability to price the use of regional roads appropriately, and create a more level playing field between the two transport modes. However, the analysis suggests that correcting for this externality is perhaps unlikely to change materially the competitiveness of rail; and

- optimising the efficiency of the rail grain supply chain in isolation might not be consistent with customer needs or the Government’s objective. A more ‘expensive’ freight supply chain might in fact be more consistent with a higher value wheat supply chain, if it allows for the creation of additional value in other parts of the supply chain (i.e. customers may be willing to pay more for freight if it enables them to maximise their returns overall).

This analysis suggests that in assessing potential investment options the focus should be on:

- what is likely to deliver the most value to the users of the grain freight services (and should not be transport mode or technology specific);

- options that are most consistent with facilitating the development of the supply chain and the WA grain industry, given its current structure (i.e. works with how the market is evolving rather than trying to work against it); and

- resolving the pressing need to provide greater certainty to all players in the market in the short term, regardless of whether the Government chooses to invest or not.

1.4 **Investment options**

There are a number of options available to the Commonwealth Government in assessing whether and how it might assist to facilitate the development of a more sustainable grain freight supply chain in Western Australia. The key options include the Commonwealth Government:

1. Participating fully, as proposed by the GIG, but based on more up to date cost estimates.

   The key risks associated with this approach are discussed above.
2 Declining to provide any funding for rail re-sleepering.
   The key risk associated with this approach is that the rail system fails sooner than expected.

3 Supporting an investment program which includes investing in certain lines and associated road investment – where the investment case is strongest.
   The key risks associated with this approach are that it is not obvious what those investments would be and there would still be a risk that these lines could be bypassed.

4 Using funding support either to encourage industry developments (e.g. reform) that might also assist in furthering the Government’s objective and / or making funding conditional on industry reform. For example, industry reforms could require greater transparency on freight and handling charges, greater accountability for the performance standards of the grain freight supply chain, and structural changes to CBH.

These options are not necessarily all mutually exclusive. Indeed, the option that is most consistent with the Government’s objective might well involve a combination of the above. This report contains an assessment of the merits and risks associated with these options. As indicated above, however, the immediate priority is to undertake a short term process to enable a decision to be made on a revised investment plan.

1.4.1 Proposed Implementation Plan

Given the lack of sufficiently detailed and up-to-date data provided by some of the key supply side stakeholders to this review, it has not been possible to provide definite advice on optimal investment solutions at a branch line level. Further analysis is therefore required.

The proposed approach involves the creation of a ‘WA Grain Freight Investment Committee’ (“the Committee”) to drive a focused, short-term process (up to three months) to produce a revised investment plan.

The composition, roles and powers of the Committee would need to be agreed by the Commonwealth and WA Governments. At a minimum, the Committee should have an independent chair who would work in collaboration with Committee representatives who should be drawn from the following parties:

- rail grain freight service providers (e.g. ARG, CBH and WestNet Rail);
- grain freight customer representatives (e.g. Australian Grain Exporters Association, Grain Industry Association of WA, Pastoralists and Graziers Association);
- other directly affected parties (road transport representatives, such as the Australian Truckers Association); and
- government (representatives from the Commonwealth, State and WA Local Government Association).
We would see the independent chair being responsible for reporting to the Commonwealth and WA Governments on the Terms of Reference for the proposed implementation plan. In addition, the independent chair would be responsible for preparing a proposed investment plan in collaboration with the committee. The independent chair would also be responsible for submitting that plan to the Commonwealth and WA governments for consideration and approval.

The key objectives of the implementation plan are to ensure that:

- government and industry participants agree a revised investment plan prior to the commencement of the 2009-2010 harvest (by October 2009) to allow execution of the investment to commence no later than May 2010;
- both the supply and demand sides of the industry have representation on the Committee and adequate input into the development of the plan;
- it encourages industry reform that is consistent with how the market is evolving and would contribute to the development of a more sustainable grain freight supply chain; and
- it has an independent Chair to ensure the critical objectives and milestones are achieved.

It would differ from the GIG process in respect of the timing, the greater involvement of users of grain freight services, the greater involvement of the Commonwealth Government and broader WA Government representatives and the degree of transparency it provides.

The key steps in initiating this process would be as follows:

- Seeking endorsement on the proposal to establish the Committee to oversee the development of investment in an enhanced WA grain freight supply chain from:
  - the Parliamentary Secretary for Regional Development and Northern Australia (the Hon Gary Gray MP);
  - the Commonwealth Minister for Infrastructure, Transport, Regional Development and Local Government (the Hon Anthony Albanese MP);
  - the Commonwealth Minister for Agriculture, Fisheries and Forestry (the Hon Tony Burke MP); and
  - the WA Minister for Transport (the Hon Simon O’Brien MLC).
- Announcement of the process following Ministerial endorsement, and with any potential funding conditional upon satisfactory completion of the process.
- Appointment of an independent chair to lead the process.
• Inviting participants from both the supply and demand sides of the supply chain to be involved as members of the Committee through a joint letter from the Commonwealth and WA Governments.

The Ministerial brief on the proposal would provide detail on the:

• Terms of Reference;

• membership of the Committee;

• key tasks and decision making process;

• timing; and

• conditions of membership (i.e. ‘open book’ process).

The Terms of Reference should, in addition to outlining the process, outline the key objective: “to facilitate the development of a more sustainable grain freight supply chain in WA”. To give effect to this objective, the independent chair in collaboration with the Committee could be invited to:

• establish the broad parameters of an efficient and sustainable grain freight supply chain in WA;

• develop a revised investment plan for the WA grain freight supply chain consistent with these broad parameters. The revised investment plan would need to include:

  - detail on the location of the proposed investment in rail re-sleepering and road upgrades;

  - analysis of the costs, benefits and risks associated with the proposed investment on an ‘open book’ basis;

  - an implementation plan for the investment outlining the key steps to be undertaken and the indicative timing, roles and responsibilities for planning, construction and commissioning;

  - a commitment to associated industry investment programs;

  - any recommendations that they are prepared to make on industry reform; and

• identify other industry reforms that may further assist in the development of a more sustainable WA grain freight supply chain, and the evidence to support the need for reform.
2 Introduction

2.1 Purpose of the review

The Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government (“the Department”) has engaged KPMG, in partnership with SAHA International (“SAHA”), to undertake an independent review of the Grain Infrastructure Group (“GIG’s”), Grain Freight Network Review report (“the GIG report”). The GIG report is not in the public domain.

The GIG was established in 2004 and comprises the WA Department of Planning and Infrastructure, Co-operative Bulk Handling (“CBH”), WestNet Rail, the Australian Railroad Group (“ARG”), and the Australian Wheat Board (“AWB”). The AWB is no longer a member since the removal of the single desk.

Our review is part of an election commitment by the then Federal Opposition in relation to primary industries. It resulted in the establishment of a taskforce in NSW (to undertake a similar review) and this review of the GIG report in WA.

The GIG report was undertaken to examine the logistics of the WA grain freight network. It recommended investment in the rail network to maintain its role in grain freight, funding arrangements to facilitate this investment and pricing arrangements to maintain the competitiveness of rail grain freight. While the GIG report acknowledged that the most efficient supply chain would involve the closure of several rail branch lines, the GIG recommended that, with government financial support, all lines could remain open benefiting the broader community and ensuring volumes are retained on the rail network. The GIG recommended the following funding:

- $400m over the next five years for investment in rail, road and fast rail loading infrastructure, of which about $200m would be for rail re-sleepering over 3-5 years; and
- a further $400m to upgrade local and State roads over the longer term, bringing the total farm gate to port supply chain package to $800m over the next 10 years.

The purpose of this review is to provide an independent assessment of:

1. The adequacy of the modelling and findings (including in terms of its scope and the assumptions that underpin it) that support the GIG’s recommendations;

2. The extent to which structural and commercial aspects of the grain market have changed since the GIG report was prepared (over 2004-2008), most notably in relation to the policy reforms embodied in the Wheat Export Marketing Act 2008, industry developments such as

---

1 Grain Infrastructure Group, Western Australia’s Grain Freight Network Review, March 2008.
2 Election 07 Policy Document Labour’s Plan for Primary Industries New Leadership 5. See Appendix 8 of the GIG report.
the establishment of Grain Express, but also in relation to changing trends in farming practice such as the increased use of on-farm storage;

3 The respective roles and responsibilities of the grain industry, road freight operators, rail freight operators (above and below track), handling and storage operators and local government;

4 The factors that influence growers choosing between road and rail as the most cost effective means of transporting their grain to port, road/rail market shares and trends;

5 The extent to which the package of measures recommended by the GIG remains the most appropriate response to the issues in light of changing policy and grain market trends;

6 The transport implications and options arising from items 1 to 5 above for the WA Government and the Commonwealth Government with respect to maintaining an efficient, effective and sustainable export supply chain for WA grain produce; and

7 The options presented with respect to item 6 above need to identify the potential risks that such options will or may pose for managing future institutional, regulatory, governance and accountability arrangements (including the possible closure of some branch lines and possible Commonwealth Government investment to address any national interest considerations). These options must also propose mitigation strategies to address such risks.

The Department’s full Terms of Reference and the associated announcement of the review are publicly available.3

This report represents the findings of our review.

We understand that our conclusions and recommendations may inform the Commonwealth Government’s decisions on funding and inform relevant government ministers.

2.2 Approach

To complete this review, we have undertaken an independent and objective assessment of the business case for the proposed investment, and consulted with a wide variety of stakeholders. In assessing the business case for the proposed investment, we have:

- identified the assumptions that are used by the GIG;
- identified the types of assumptions made and the basis for those assumptions;
- examined the materiality of those assumptions to determine those that are most critical to the conclusions drawn and recommendations made;

tested the veracity of those assumptions and how they have been applied;

used this analysis as a basis for drawing conclusions about the veracity of the GIG’s conclusions and recommendations and to provide advice to the Commonwealth Government on the options that exist to ensure the development of a more sustainable grain freight supply chain in Western Australia; and

undertaken an assessment of the risks associated with these options and how they might be mitigated.

SAHA have assessed the technical, cost and market assumptions that underpin the GIG report, and we have relied upon their work in undertaking our analysis. The outputs of SAHA’s work can be found at Appendix K.

In undertaking this work we have been provided with confidential access to the GIG model and certain company data. To meet our requirements in this respect we are obliged to present the results in a way that does not divulge the relevant information, whilst presenting as much information as possible to provide transparency on the basis for our conclusions.

2.2.1 Stakeholder consultation

During the course of our review, we have consulted with a wide variety of stakeholders. This has included meeting with:

- the GIG and its representative organisations including the Department for Planning and Infrastructure ("DPI"), both collectively and individually;
- members of the GIG Working Party;
- other relevant Western Australian government departments (e.g. the Department of Treasury and Finance);
- freight user groups;
- grower representative groups; and
- other relevant stakeholders.

A full list of the stakeholders consulted is included in Appendix A. These stakeholder consultations have been undertaken primarily to:

- understand the nature of the analysis in the GIG report and the basis of the assumptions that underpin it; and
- test those assumptions by talking to other market participants and industry experts.
2.3 Structure of this report

The remainder of this report contains the following sections:

- section 3 provides an overview of the WA grain industry and supply chain;
- section 4 provides an overview of the GIG report, and its conclusions and recommendations;
- section 5 describes the approach we have used in assessing those assumptions and summarises the results obtained;
- section 6 examines the investment options and risks; and
- section 7 outlines a proposed approach to developing a revised investment plan.

This report also contains a number of appendices that contain relevant information in regard to the analysis undertaken:

- Appendix A contains a list of stakeholders consulted as part of this process;
- Appendix B contains detailed information on the GIG costs and benefits and issues surrounding these;
- Appendix C contains an explanation of the factors that influenced our approach to assessing the GIG proposal;
- Appendix D contains detailed information on the cost benefit analysis using the GIG data and assumptions;
- Appendix E contains detailed information on the cost benefit analysis using updated cost data;
- Appendix F contains detailed information on the cost benefit analysis including all costs and benefits;
- Appendix G contains more detailed information on testing the costs and assumptions underpinning the GIG investment proposal;
- Appendix H contains an explanation of the principles of bypass;
- Appendix I contains an overview of CBH's strategy and corporate structure and its relevance to the risk of bypass of the rail network;
- Appendix J contains information supporting KPMG’s analysis on discount rates and an electricity industry case study; and
- Appendix K contains SAHA’s report on the technical, cost and market assumptions used in the GIG report.
3  WA grain industry and supply chain overview

This section provides a brief overview of the WA grain industry and supply chain.

3.1  Grain production

WA is a major producer of wheat, barley, canola and lupins, accounting for around 41 per cent of Australia’s total winter crop in 2008-09 (refer Table 3-1).

<table>
<thead>
<tr>
<th>Table 3-1: WA crop estimates 2008-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Barley</td>
</tr>
<tr>
<td>Canola</td>
</tr>
<tr>
<td>Lupins</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: ABARE, Australian Crop Report, February 2009

Production occurs in the southwest corner of WA, known as the Wheatbelt. The area planted with winter crops covered around 7.4m hectares in 2008-09. This area can be divided into four separate port zones or districts – Albany, Esperance, Geraldton and Kwinana (refer Table 3-2 for typical export volumes from each port).

<table>
<thead>
<tr>
<th>Table 3-2: Typical grain export tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export volume (kt)</td>
</tr>
<tr>
<td>Albany</td>
</tr>
<tr>
<td>Esperance</td>
</tr>
<tr>
<td>Geraldton</td>
</tr>
<tr>
<td>Kwinana</td>
</tr>
</tbody>
</table>

Source: Sd+D, Transport Infrastructure Issues Paper One, Network Review for the Australian Grains Industry, January 2007, p. 26

The WA Department of Agriculture and Food estimates that, whilst grain production variability is expected to increase due to climate change (particularly in lower rainfall areas less than 350mm per annum), overall production is expected to increase under a number of scenarios (refer Table 3-3 below).
Table 3-3: WA grain production over next 25 years

<table>
<thead>
<tr>
<th>Estimate (kt)</th>
<th>Increase</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (baseline)</td>
<td></td>
<td>14,000</td>
</tr>
<tr>
<td>High</td>
<td>4,900</td>
<td>18,900</td>
</tr>
<tr>
<td>Low</td>
<td>2,300</td>
<td>16,300</td>
</tr>
</tbody>
</table>


The WA Department of Agriculture and Food has also projected that the distribution of production is expected to shift towards the west and south over the next 25 years, which are generally closer to ports (refer Figure 3-1 below).

Figure 3-1: Projected change in production distribution – low estimate (LHS) and high estimate (RHS)
The WA grain industry is largely export oriented. Historically, around 80 per cent of grain produced in WA has been for the export market through AWB and the Grain Pool of WA. Given that the overwhelming majority of grain from WA is exported, the grain freight supply chain focuses on moving grain from the farm gate to one of the four ports. In comparison, the grain freight supply chain in the eastern states (where around 54 per cent is produced for the domestic market) is more complex with movement of grain to a greater number of locations, including interstate movements.

3.2 Grain freight supply chain

The freight networks used to move grain to market include:

- road transport from farm gate to silo;
- rail or road (or both) transport from silos to major receival or transfer sites and/or ports; and
- road to port via private storage.

Historically, the market share of rail has slowly fallen, but with overall volumes maintained. Rail now accounts for around 60 per cent of grain transport from silos to ports.

Off-farm supply chain costs (including farm to silo) represent up to 15% of growers’ total operating cost of production and between 14% and 26% of the total sale value (SAHA report, section 3.3.2).

The key components and operators of the WA grain freight supply chain are summarised in the diagram below.
Figure 3-2: Current WA grain freight supply chain schematic

Source: Adapted from Sd+D, Review of grain supply chain coordination models - Final Report, May 2008, p.7

Rail network

Figure 3-3 shows WestNet Rail’s grain network in southwest WA. The rail network comprises a combination of standard, dual and narrow gauge track. The sections highlighted in yellow are the narrow gauge track used almost exclusively for transporting grain.

Much of the rail network was built in the early part of the 20th century (in part to supply coal to the Goldfields). Some follow natural water courses in order to minimise gradient, which means the network cover distances longer than necessary with more modern technology.
Figure 3-3 shows the current sleeper types across the network and highlights that only every fourth sleeper is steel (with the remaining sleepers made from timber) in large sections of the narrow gauge track used exclusively for transporting grain. The re-sleepering investment proposed as part of the GIG investment package is primarily designed to upgrade the network to a 1-in-2 steel sleeper format, which will increase the asset life by 10-15 years.
Figure 3-4: Current sleeper types on WestNet Rail’s grain network

Source: WestNet Rail presentation, March 2009

Storage and handling

CBH is an integrated business that stores, handles and markets grain in WA (refer Figure 3-5 below). Appendix I has further discussion on CBH’s business.

Rationalisation of grain receival sites has seen the number of receival sites drop from over 300 in the 1960s, to 197 receival sites today. We understand that CBH’s investment strategy involves the rationalisation of the use of receival sites, but not significant closures.4

4 We understand that this is because many sites may be required in large crop years, are inexpensive to retain (but may be expensive to close and remediate).
Figure 3-5: CBH’s grain receival and storage network

Source: CBH website,
3.3 Recent industry developments

The storage, handling and transportation of grain have been deregulated in Australia since the McColl Royal Commission in 1989.

Recent years have seen significant changes to the industry with the introduction of the Wheat Export Marketing Act 2008 and CBH’s Grain Express Initiative.

3.3.1 Wheat Export Marketing Act 2008

Important changes to the export of bulk wheat occurred with the introduction of the Wheat Export Marketing Act 2008 (“WEMA”) on 1 July 2008.

Under WEMA, the Australian Wheat Board (“AWB”), through its subsidiary Australian Wheat Board International Ltd (“AWBI”), no longer has exclusive control of the export of bulk wheat through the ‘single desk’. A new industry regulator, Wheat Exports Australia, has been established to accredit potential exporters to ensure that companies are “fit and proper”\(^5\).

WEMA requires accredited exporters that operate bulk grain terminals to pass the Port Terminal Access test, which requires bulk handlers to publish their daily shipping programs, policies and procedures for managing demand for the terminal, and port terminal access terms and conditions for other grain exporters on their website. After 1 October 2009, exporters will be required to enter into an ACCC-approved access undertaking under Part IIIA of the Trade Practices Act.

In August 2008, CBH’s trading subsidiary Grain Pool Pty Ltd became an accredited bulk wheat exporter under the new arrangements. There are now 23 accredited wheat exporters across Australia.

The barley, lupins and canola grain markets in WA are also set for deregulation later this year.

3.3.2 Grain Express

Grain Express is a recent initiative by CBH which offers growers and marketers new supply chain co-ordination services. By using CBH’s storage and handling system, growers and marketers do so on the condition that CBH arranges the transportation of that grain from 197 receival sites to one of 15 ‘destination sites’ where growers or marketers are able to outturn grain from CBH’s custody.

The practical implications of Grain Express are that it:

- limits the number of sites where an acquirer can outturn grain;
- enables CBH to decide how to transport grain; and

\(^5\) Part 1, Section 4, Wheat Export Marketing Act 2008
allows growers or marketers to outturn grain of the same quality and quantity from CBH, but not necessarily the actual grain received.

The ACCC completed a review of the Grain Express proposal in September 2008 under its role in administering the Trade Practices Act 1974 to prevent anti-competitive arrangements or conduct. The ACCC concluded:

... there are likely to be significant efficiency benefits as a result of the central coordination of grain storage, handling and transportation in Western Australia under the proposed Grain Express system.

... [they are] not satisfied that the notified conduct has the purpose, effect or likely effect of substantially lessening competition within the meaning of section 47 of the Trade Practices Act.

The ACCC based their decision not to revoke CBH’s exclusive dealing notification on the following:

• the proposed arrangements do not prevent potential competitors entering the market for grain receiveal, storage and handling and may stimulate competition for CBH transport contracts;

• growers and marketers are free to arrange transport of grain from the farm gate to end user point or from a destination site to end user point;

• grain acquirers and marketers will continue to be able to exploit niche marketing opportunities; and

• CBH’s amended ring fencing policy provides an adequate framework to limit the access and anti-competitive use of information by CBH’s trading subsidiaries.

The ACCC can review this decision at any time.

Performance of Grain Express to date

The 2008/09 grain harvest has proved difficult with a large crop of over 12.3 million tonnes of grain produced and unseasonal weather during harvest resulting in delayed grower deliveries into the CBH storage system.

We understand that Grain Express has had a difficult introduction given:

• delays in growers assigning or selling their grain to marketers;

---

6 ACCC, Decision in respect of a notification lodged by Cooperative Bulk Handling Ltd, 8 September 2008, p.ii
7 Ibid
• delays in the market selling grain and therefore making early vessel nominations for shipment;
• delays in CBH being able to pre-position grain at port for shipment due to hot weather train running restrictions;
• market uncertainty about the vessel allocation process and its lack of transparency; and
• perceptions about CBH’s allocation of shipping capacity to various marketers including its own marketing arm, the Grain Pool of WA.

As a result, we understand that there have been significant shipping delays and costs incurred by the market due to the number of vessel nominations received over the early part of the year.

A number of growers and traders raised concerns during the consultations about the management and operation of Grain Express. At least some previous supporters would be unlikely to support its retention in the future. Reasons for their position are varied, but most relate to issues or perceptions regarding:

• CBH’s response to the market’s advice on how to address issues with the allocation process;
• a lack of transport planning to meet market requirements despite what they feel has been adequate notice;
• alleged favouring of Grain Pool vessel allocations;
• a lack of transparency in the allocation process and in decisions taken to re-order vessel queuing;
• a belief that the allocation process discriminates against grain traders as opposed to marketers who operate pools; and
• a lack of preparedness to accept financial responsibility for its actions and/or poor performance.

---

8 SAHA report, section 3.2.1
9 Some argued that this support was always highly conditional (i.e. because Grain Express was the only viable alternative at the time).
4 Grain Infrastructure Group (GIG) Freight Network Review

This section provides an overview of the GIG report.

4.1 The Grain Infrastructure Group

Key investors in the grain supply chain established the GIG in 2004, including representatives from:

- **DPI** – the WA Department responsible for planning and delivering social and economic infrastructure.

- **ARG** – who operates the narrow and standard gauge locomotives and wagons across WA. ARG is a subsidiary of Queensland Rail.

- **WestNet Rail** – who operates the 5,100km standard, narrow and dual gauge network in southwest WA. The WA Government granted WestNet Rail a 49-year lease in 2000 to manage the intrastate rail network. WestNet Rail joined the GIG in 2006, the same year that Babcock and Brown Infrastructure contracted to purchase the business from Genesee & Wyoming Inc. and Wesfarmers Ltd.\(^\text{10}\)

- **CBH** – who stores and handles grain in WA and also markets grain for export. CBH was formed as a cooperative in 1933 and is controlled by around 4,800 grower members across WA.

- **AWB** – the then Government mandated exclusive exporter of Australian bulk wheat under the ‘single desk’\(^\text{11}\).

Other government stakeholders, such as the WA Department of Treasury and Finance and the Commonwealth Government, have been presented with the findings from the GIG’s review, but were not involved in the process.

\(^\text{10}\) The purchase price for 100% of WestNet Rail was AUD$853.5m plus transaction costs and upfront provisions. BBI acquired a 51% interest in WestNet Rail ($435.3m plus the proportional share of transaction costs and upfront provisions) and had a call options to acquire the remaining 49% at a pre-agreed exercise price. According to the BBI website, BBI currently owns 76% (with call option over remaining 24%).

\(^\text{11}\) AWB is no longer a member of the GIG given their more limited role in the WA grain industry following the removal of the single desk.
4.2 Background to the GIG review

The GIG report was completed in March 2008 and presented to the Australian Government to support a request for rail network funding under the AusLink program (now the Nation Building Program). The review aimed to identify:

- the requirements in developing a sustainable grain freight supply chain; and
- necessary transport infrastructure investment to meet predicted grain freight growth and the needs of the industry for the next 10+ years.

In undertaking the review, the GIG focussed on:

- assessing the future viability of the narrow gauge rail system that is used solely for the transport of grain; and
- clearly determining the impacts, particularly on the state and local government road network, of any rail or grain receival site rationalisation.

Prior to publication of the GIG review, several other studies were conducted, some initiated by the GIG. The results of these studies were used to inform the analysis in the GIG review.

Table 4-1 outlines the key reviews that have taken place since formation of the GIG and several other key developments in the WA grain industry.

Table 4-1: Key steps in WA grain freight review

<table>
<thead>
<tr>
<th>Date</th>
<th>What occurred</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>GIG established</td>
<td>The GIG was established to replace the Grain Logistics Committee which had been in operation since 1997. Representatives from DPI, ARG, CBH and AWB were appointed.</td>
</tr>
<tr>
<td>2004</td>
<td>WA Strategic Grains Infrastructure Study (WASGIS)</td>
<td>GIG initiated this study to analyse the impact of commercial strategies of industry players and provide direction to negotiation of the next industry grain freight agreement. Sd+D were engaged to undertake the study which was conducted as a top-down independent review.</td>
</tr>
<tr>
<td>2004</td>
<td>Grain Network Review (GNR)</td>
<td>ARG and CBH initiated a detailed bottom-up supply chain analysis of their networks in order to develop a transport network aligned with CBH’s strategic receival plans. The outcomes were intended to inform the negotiation of the next grain freight agreement.</td>
</tr>
</tbody>
</table>

12 CBH developed a Grain Express strategy which was submitted to the ACCC as a notification subsequently accepted by the ACCC in 2008.
<table>
<thead>
<tr>
<th>Date</th>
<th>What occurred</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2004</td>
<td>Report on Options for Public Assistance for Rail Infrastructure Financing</td>
<td>The Planning and Transport Research Centre (PATREC) published a report commissioned by the WA DPI to assist with consideration of options for establishing a program of public financial support for investment in new and upgraded railway infrastructure.</td>
</tr>
<tr>
<td>April 2005</td>
<td>Sd+D Final Report</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>WestNet Rail becomes a member of the GIG</td>
<td></td>
</tr>
<tr>
<td>October 2006</td>
<td>Wheatbelt Region Road Evaluation Study – Final Report</td>
<td>Parsons and Brinckerhoff prepared a report for the representative Councils of the Wheatbelt North and South Road Groups. The purpose of the study was to demonstrate the importance of maintaining ongoing road funding allocations at a level that will deliver a sustainable and adequate regional road network.</td>
</tr>
<tr>
<td>December 2006</td>
<td>2006 Grain Freight Study – Road Impact Analysis Report</td>
<td>Lowes Churchill &amp; Associates prepared report for DPI. The purpose of the report was to present an assessment of the road system impacts as a result of rail closures including the associated costs to upgrade and maintain the roads to a standard necessary to handle the increase in freight volumes.</td>
</tr>
<tr>
<td>March 2006 -- December 2007</td>
<td>DPI undertook independent verification of analysis undertaken by CBH and ARG for GNR. Modelling used commercial-in-confidence data.</td>
<td></td>
</tr>
<tr>
<td>July 2007</td>
<td>Letter from then WA Minister for Planning and Infrastructure (Alannah MacTieman) (WA Government) to then Commonwealth Minister for Transport and Regional Services (Mark Vaile) requesting $133m (2007/08 dollars) in upfront capital as the Commonwealth’s share along with the WA Government and industry also contributing one-third towards the proposed $400m GIG investment.</td>
<td></td>
</tr>
<tr>
<td>October 2007</td>
<td>Internal DPI report on The States Grain Industry appended to a Confidential Report to DTF. Further detail underpinning analysis for the Rail Rescue Package considered by ERC.</td>
<td></td>
</tr>
</tbody>
</table>

13 Planning and Transport Research Centre, Report on Options for Public Assistance for Rail Infrastructure Financing, report for the WA Department of Planning and Infrastructure, October 2004
14 Sd+D, WA Strategic Grain Infrastructure Study, report for the WA Department of Planning and Infrastructure, Australian Railroad Group, AWB Ltd and CBH Limited, April 2005
15 Parsons Brinkerhoff, Wheatbelt Region Road Evaluation Study – Final Report, report for the Wheatbelt North and South Regional Road Groups, October 2006
### Approach

The GIG report consolidated the findings from the above studies and, on the basis of a model, assessed the total resource costs of several alternative network scenarios based on branch line closures. Stakeholders (WestNet Rail, ARG, Main Roads and CBH) provided commercial-in-confidence information on their operating and capital costs so that total resource costs per tonne of grain transport could be assessed under each scenario. This was done by examining the commercial viability of the businesses owning the assets both before and after the recommended investment. It also involved estimating the total resource costs on a per tonne basis at a branch line level.

The weighted average cost of capital, Return on Capital Targets and the time period over which the expended capital could be depreciated were provided. The capital expenditure projects comprised:

- Below rail: Branch line Re-sleepering Program;
- Storage & Handling: Rapid Rail Loading and Road and Rail access works;
- Above rail: Replacement of Locomotives;
- Below road: Road construction and repair costs; and
- Above road: Replacement of Prime movers and trailers.

Costs were provided for each of the following four line closure scenarios:

- Scenario 1: The surrender of about 500km of railway comprising five lines, as recommended by the WA Strategic Grain Infrastructure Study;
- Scenario 2: The closure of 1,000km of railway be surrendered involving 12 line sections, as recommended by the Industry Grain Network Review Study (the “GNR 1000”);
- Scenario 3: The surrender of about 650 km of railway involving 8 line sections, as proposed by the GIG; and
- Scenario 4: All lines retained.
Table 4-2 details the branch lines included in the GIG analysis and the GNR 1000 analysis.

Table 4-2: Grain rail lines and those included in the GNR 1000 analysis

<table>
<thead>
<tr>
<th>GIG analysis</th>
<th>GNR 1000</th>
<th>GIG650</th>
<th>WASGIS 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Cross - Kwinana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmon Gums – Esperance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wagin – Albany</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wagin – Lake Grace</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Katanning – Nyabing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tambellup – Gnowangerup</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hyden – Lake Grace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newdegate – Lake Grace</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maya – Narungulu (a)</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Marchagee – Dongara</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrogin – Yearlering</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Kulin – Yillimining</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>York – Ouairading</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrogin – Avon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bullaring – Merredin</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Kondinin – Merredin</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Trayning – Merredin</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Millendon – Watheroo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amery – Mukinbudin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amery – Kalannie Beacon</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goomalling – McLevie</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Toodyvay – Milling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avon - Amery</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Only the Maya to Perenjori component of this line would be closed under each of the GNR1000 and GIG650 line closed scenarios

The assumptions used in the modelling of costs are discussed below and in the following chapters.

### 4.4 Key assumptions

The GIG report relies on a large number of assumptions. These assumptions can be grouped by type and/or by the key variables in the analysis they impact upon.

In relation to type, the key assumptions include:

- general economic assumptions (e.g. the cost of capital, market growth);
technical and cost assumptions (e.g. the feasibility and costs of the proposed investments);

market and commercial assumptions (e.g. the competitiveness of rail, grain storage, handling and transport costs as a proportion of end-customer price);

funding and pricing (e.g. the funding source for future investment, the competitiveness of rail and road pricing); and

policy, institutional and regulatory (e.g. it preceded the changes that have recently occurred in the market)

The key variables the assumptions impact upon include:

- forecast volumes;
- below rail costs;
- above rail costs;
- below road costs;
- above road costs; and
- the competitiveness of rail versus road.

As section 5 shows, while there are numerous assumptions underpinning the GIG report, there are relatively few assumptions that are critical to the results generated. Because of this, our approach focuses on those assumptions.

This is discussed in further detail in section 5.

4.5 Key findings

The GIG review identified the following key issues regarding the viability of the grain freight network in WA:

- in the past, the grain rail freight business has been a marginally viable operation providing below average commercial returns. If the current supply chain arrangements continue, there will be little incentive for the below rail operator to invest in long term track infrastructure;

- changes in the grain market have resulted in further weakening of the rail freight system as an increased share of freight is being diverted to the road sector. This has been facilitated by
the “un-level playing field” that exists in road and rail pricing whereby the marginal cost of road use is substantially lower than the price paid by the user;

- a sustainable rail system will require one or more of the following:
  - some rail network rationalisation and branch line re-sleepering;
  - road network investment;
  - upgrading of rail and grain receival and rail loading infrastructure; and
  - subsidisation of some current rail services;

- regardless of which rail closure scenario is adopted, $400m is required over the next five years for investment in transport infrastructure (rail, road and rail loading) with $200m for rail re-sleepering required in the next three to five years; and

- a $400m investment to upgrade local and State roads is also required, bringing the total farm gate to port supply chain package to $800m over the next 10 years.

4.6 Key recommendations

The GIG review made the following key recommendations:

- Development of a commercially based Land Transport Grain Infrastructure Investment Agreement which minimises leakage from the rail grain network: This agreement would require the following funding over the next 10 years:
  - $200m from the Federal and State government for rail re-sleepering projects;
  - $150m from CBH invest for grain rail support package for improved rapid rail loading facilities and related works; and
  - $50m from Federal and State government for road to rail receival sites.

In addition, WestNet Rail to invest as necessary and maintain the 2,300 km of grain rail branches and ARG invest in rolling stock maintenance and other capital expenditure.
The GIG also recommended a further $400m to upgrade local and State roads over the longer term, bringing the total farm gate to port supply chain package to $800m over the next 10 years.\(^{17}\)

- Development of a Commercial Freight Agreement: This is to be executed at the same time as the land Transport Grain Infrastructure Agreement on terms satisfactory to all parties to reflect the long term commitment (10 years) of parties.

- While GIG acknowledged the most efficient supply chain involved the closure of several rail branch lines, the GIG recommended that, with government financial support, all lines could remain open benefiting the broader community and ensuring volumes are retained on the rail network.

\(^{17}\) This investment did not appear to be included in the proposed Land Transport Grain Infrastructure Investment Agreement.
5 Assessment of the GIG investment proposal

This section reviews the GIG investment proposal and includes:

- an outline of our approach to reviewing the GIG proposal;
- the results of our cost benefit analysis:
  - using GIG costs and assumptions;
  - using updated cost information provided by stakeholders;
  - including all costs and benefits and varying:
    - discount rates;
    - externalities; and
    - energy prices;
  - using SAHA’s assessment of the costs and benefits of the investment package; and
  - varying the market share assumption.
- discussion of the implications of the market share assumption used in the GIG analysis.

Appendices B - I provide additional detail of our assessment.

5.1 Our approach to reviewing the GIG proposal

This section outlines how we have assessed the assumptions used in the GIG’s work. This section includes:

- an outline of the framework adopted in assessing the GIG proposal:
- the types of costs and benefits identified by the GIG and the key issues regarding the GIG assumptions and data; and
- the approach used in undertaking a cost benefit analysis of the GIG investment proposal.
5.1.1 Our assessment framework

To assess the assumptions underpinning the GIG report and its conclusions, we have adopted principles consistent with those used in standard approaches to cost benefit analysis by most governments and agencies in Australia for capital business cases (e.g. by Infrastructure Australia\(^{18}\), although this project is under the Nation Building program\(^{19}\)), including those used in the transport sector.\(^{20}\)

In our experience, these principles are also consistent with investment evaluation criteria commonly used in commercial practice, notwithstanding the different focus they involve.\(^{21}\)

Some of the key characteristics of the framework for our review are outlined below:

- Only incremental economic costs and benefits are considered. In other words, all sunk costs are ignored and the costs and benefits considered are total incremental economic (or resource) costs or benefits that the investment will incur or produce.

- All types of economic costs and benefits are considered. This includes ‘external’ costs and benefits, including those that are difficult to quantify and/or monetise, regardless of who bears those costs or enjoys the benefits. It therefore assesses the cost and benefits from a “societal” or community perspective. It also focuses on ‘first round’ or direct impacts, but also discusses ‘second round’ impacts where they may be material.\(^{22}\) This is particularly relevant to this review because some of the key benefits of the proposed investment relate to the external costs that might be imposed by greater use of road in the grain freight task.

- It separates consideration of the investment decision from funding and pricing decisions. In other words, our review focuses in the first instance on whether the investment is justified based on the economic costs and benefits associated with the project, rather than how it might be funded.\(^{23}\) To be consistent with this, we have also ignored transfers of wealth.\(^{24}\)

---


\(^{21}\) The focus in commercial investment evaluations is typically on the financial benefits to the proponent rather than the economic benefits to society.

\(^{22}\) The first round impacts are the primary impacts caused by the investment decision. Second round impacts typically look at how the first impacts affect prices (and stakeholders’ incentives) and thus their behaviour.

\(^{23}\) In principle, if the investment produces net economic benefits (i.e. generates wealth), the funding and pricing decisions are respectively about the sharing of the costs and benefits to ensure the investment proceeds and the parties’ incentives are aligned with achieving the benefits.
Examines the market competitiveness issues in some detail to understand the factors that are driving the choices growers make in deciding whether to use rail or road freight. Market share assumptions are typically one of the most critical variables in business cases (i.e. as they typically dictate the size of the benefits), particularly where governments are seeking to intervene to influence market outcomes. If the drivers of customers’ decisions are not fully understood, there is a high risk that government intervention will fail to produce the expected benefits (e.g. a higher market share for the supported product or service).

This framework has a number of implications for the assessment of the assumptions used in the GIG report. Several of the critical differences between our approach and the GIG report are:

- the GIG report takes more of a total cost approach (i.e. including sunk costs). As a result, the GIG outputs are not based on the standard approach to reviewing investment decisions;

- the GIG report ties the funding and pricing decisions to the investment decision, as it sought to demonstrate:
  - the investment is justified in economic terms;
  - with government funding, rail would be competitive with road in total cost terms over the grain freight supply chain (i.e. below and above ground), provided road costs are appropriately ‘priced’ or otherwise taken into account; and
  - the businesses operating in the grain freight supply chain would be commercially viable.

- the GIG report assumes (although not totally consistently) that, with the investment package, the market share of rail will be maintained. As discussed above, market share assumptions are critical to business cases and if incorrectly estimated the expected benefits of the investment may not be realised. Moreover, while the supply side of the industry was heavily involved in the development of the GIG report, the demand side, i.e. the customers who pay to use freight services, were only indirectly involved in the process via AWB. Since that time, however, the market has changed considerably. Section 5.3 discusses these issues in further detail.

5.1.2 The types of costs and benefits identified by the GIG

The GIG proposal essentially involves investing to maintain the rail network so that it can be used to a greater extent to transport grain, instead of using the road network. Table 5-1 below summarises the in-principle economic impacts of the proposed investment. (Appendix B discusses each of the costs and benefits in greater detail).

---

24 Transfers typically relate to how the costs and benefits are borne by the various parties and shifted between them as a result of any new decisions, in part by virtue of funding and pricing decisions.
Table 5-1: Overview of the costs and benefits of the GIG proposals

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investment in re-sleepering the rail network by WestNet Rail</td>
<td>1. Avoided costs of road expenditure. The net cost of upgrading and maintaining the road network in light of higher grain freight traffic</td>
</tr>
<tr>
<td>2. Investment in grain receival, storage and handling facilities</td>
<td>2. Avoided investment in above road rolling stock and avoided above road operating costs</td>
</tr>
<tr>
<td>3. Investment in local road upgrades</td>
<td>3. Avoided external costs of greater use of the road network by grain freight traffic</td>
</tr>
<tr>
<td>4. Investment in above rail rolling stock and the incurrence of above rail operating costs</td>
<td>4. Avoided investment in above road rolling stock and above road operating costs</td>
</tr>
</tbody>
</table>

Key issues with the GIG assumptions and data

Our review has highlighted that there are a number of issues with the integrity of GIG assumptions and data. Specifically:

- The GIG report and modelling are based on what appear to be “pre-feasibility” estimates and are likely to be subject to significant bounds of uncertainty (+/- 20 per cent at least). For example, the estimated cost of re-sleepering for the initial analysis was based on desktop analysis. WestNet Rail have since provided updated re-sleepering cost data which has seen an increase in unit costs and the effective closure of two branch lines regardless of the investment in the rail network.

- While stakeholders provided cost inputs into the GIG model, the input data has come from various sources at various times and often is not completely consistent in terms of the issues to which it relates (e.g. the same lines, or incremental costs only). This data has not been audited (although we understand it was provided on the proviso that it might be) or externally peer reviewed (although some comparisons between the GIG data and external sources were made). There are significant advantages in using industry data (e.g. it means it should relate to the right issues), but also some potential disadvantages (i.e. if stakeholders have ‘strategic’ incentives).

- The model uses the above data, and some other analysis undertaken, but has not of itself been peer reviewed. Indeed, we understand that nobody other than the developer of the model has had any access to it. The model has no guide for users therefore it is difficult to determine precisely what assumptions have been used and how they have been used.

---

25 For example, the road upgrade costs used in the GIG analysis are those estimated in the Lowes Churchill Associates (2006) road impact study which notes “the accuracy of the estimates used in this report for the road upgrading are in the order of +/-20%. It is even more difficult to assess the potential change in road maintenance costs associated with an increase in traffic” p5.
There appear to be a number of inconsistencies between the assumptions and data used in the GIG modelling and what is provided in the GIG report. For example, there is ambiguity in the report over the source of several of the conclusions, in particular whether they are results from the GIG modelling, or are based on evidence from other reports that have or have not been substantiated by the GIG modelling.

There are instances of data inconsistencies either in terms of when the data was developed or what it specifically relates to. For example, the cost estimates associated with different rail closure scenarios, in some cases are not based on road upgrade costs collected for those lines.

The key implications of these factors for our assessment are that:

- there is limited value in attempting to develop an overly precise estimate of the costs and benefits associated with the proposed investment because it would involve spurious precision and risk further errors. A relatively high level and more strategic assessment of the costs and benefits is therefore all that is possible and prudent to undertake; and

- there are significant complexities in making simple comparisons in results between the GIG and our results, and within the GIG work across different scenarios (on lines closures) or using different assumptions on key inputs. Nevertheless, these issues are addressed to the greatest extent possible in the analysis.26

These factors have been taken into account in our approach which is described below.

5.1.3 **Our approach to reviewing the GIG investment proposal**

This section outlines the approach taken to assess the costs and benefits of the proposed investment, in light of the issues identified above. Several key factors relevant to the approach are identified below (see Appendix C for a more detailed discussion on the factors influencing the approach):

- The GIG investment package contains three discrete types of investments:
  - re-sleepering to maintain the integrity of the rail network;
  - upgrading rail receival facilities to improve the efficiency of rail and its competitiveness with road; and
  - road investment to better integrate with rail receival sites.

---

26 However, given the lack of clarity surrounding some of the underlying material, the assumptions and data might not have always been interpreted precisely as intended. Nevertheless, for the reasons indicated, this is unlikely to alter the key conclusions.
Given this, it is appropriate to examine the re-sleepering investment in isolation in the first instance by comparing the cost of the investment with the benefits (i.e. the avoided investment in roads). This would also be consistent with what the Commonwealth Government is being asked to help fund.

- The GIG report does not identify how much the market share of rail would (presumably) fall, with the re-sleepering investment, but without the investment in the rail receiveal facilities. The GIG report therefore does not identify the benefits of the re-sleepering investment (i.e. the avoided costs of investing in roads) in isolation. This seems to be an important oversight as the economic benefits may not be realised if rail does not maintain its market share.

- The assumption that above road and above rail are competitive underpins the GIG investment proposal. While the above road and rail costs are an important factor in determining market share these costs are not important to the below ground investment decision.

- Local road costs have been excluded from the cost benefit analysis given the investment is required regardless of the rail investment.27

Thus the key features of our approach are that it:

- attempts to isolate the various components of the investment decision;
- ignores above rail and above road costs; and
- takes into account data quality and quantity limitations.

Our approach is illustrated in Figures 5.2-5.4 below.

Figure 5-2 illustrates that, for the purposes of assessing the investment decision we have focussed on below rail and road costs. The darker shaded above rail and roads costs have been ignored because:

- the investment case is premised on the assumption that above ground, rail and road are (or at least can be) competitive. The investment package is about delivering a rail network which enables rail freight to compete with road at least over the medium term; and
- with no change in market share, there is no incremental investment required above road and rail (over and above that required to meet market growth more generally).28

---

27 The GIG considered the investment in local roads was required whether the lines were open or closed. In the event of rail closure some additional investment may, however, be required in local roads. For consistency with the GIG we have not included these costs however have made reference to available cost estimates from other reports.
The key impact of adopting this approach relative to the GIG approach, is our analysis isolates the costs and benefits relevant to the key investment decision.

Figure 5-2: Investment evaluation outline

Figure 5-3 below illustrates the below ground costs we analysed to test the strength of the case for the investment recommendations made by GIG.

28 To the extent that this investment led to changes in the volume of grain freight traffic, it might also result in investment in new rolling stock (by ARG). The GIG assumes that the market share of rail will, however, remain the same so that incremental investment in rolling stock would only be required to meet general growth associated with grain volumes. Similar investment in the road ‘rolling stock’ would, however, be required in this instance as well.
Figure 5-3: Investment evaluation: Costs – Below rail

Figure 5-3 shows the below rail costs incurred by WestNet to maintain the integrity of the rail network. The darker shaded CBH-related below rail and roads costs are discussed primarily in the context of examining the market share assumption. It also shows the key types of assumptions on which the costs are based.

Figure 5-4 below illustrates the below rail benefits (i.e. avoided costs and external costs).
In light of the above, our assessment of the costs and benefits can be summarised in the following table.
Table 5-2 outlines the approach used to test the GIG proposal using different data and assumptions. A summary of these results are discussed below in section 5.2 while the detailed results are presented in Appendices D to G.

At the highest level, the investment in the rail network (or parts thereof) would be justified if it is reasonable to expect that the net present value of the benefits would be higher than the net present value of the costs. The benefit cost ratio is a tool that allows comparison of investment options including comparison against the status quo. As illustrated in Table 5-2, the benefit cost ratio should be greater than one (benefits are greater than the costs).

Unpacking the GIG assumptions

In light of the above, and the way in which the GIG analysis has been undertaken, the most practical way to assess the economic merits of the GIG proposal is to ‘unpack’ and test the
assumptions in several stages. To do this, we have examined the economic merits of the investment:

- **Using GIG costs and assumptions** – which we do at two levels:
  - the rail re-sleepering investment in isolation; and
  - the total investment package.

- **Using updated cost information provided by stakeholders** - but otherwise based on the GIG assumptions. In essence, this analyses whether the GIG investment is worthwhile on its own terms.

- **Including all costs and benefits** - that arguably should be included in such an analysis, and testing the results by varying discount rates, energy prices and the value of externalities associated with greater use of roads by grain freight.

- **Using SAHA’s assessment of the costs and benefits of the investment package** - but otherwise using the GIG assumptions.

- **Varying the market share assumption** - that rail freight market share would be maintained.

### 5.2 Summary of results

This section outlines the results of the analysis of the GIG investment proposal.

The required investment for each component of the package was based on modelling undertaken by the GIG and described in the GIG report. The investment amounts used to derive the cost benefit ratios in this section are in net present value (NPV) terms using a 4 per cent discount rate.

We note that, for the reasons identified in section 5.1 in particular, assessing the GIG proposal is not a straightforward task and cannot be completed without making significant judgments and simplifying assumptions in order to make relevant and reasonable comparisons. We have endeavoured to detail the key judgements and assumptions we have made in qualifying the numbers used and results obtained. Nevertheless, it is apparent that varying the application of these judgements and assumptions is unlikely to have a material impact on the key conclusion.

In addition, the GIG investment package and data is now somewhat dated. With these caveats in mind, the results are as outlined below.

At an overall level, and using the GIG costs and key assumptions, the costs of the proposed investment package are likely to exceed the benefits.
The results have been tested by varying the key assumptions underpinning the GIG analysis. On the basis of this analysis, the outcomes either:

- do not vary materially (although higher energy costs favour rail); or
- would appear to get materially worse.

In other words, the costs of maintaining all rail lines are likely to be higher than the additional costs of having more grain freight on the roads and providing capacity to suit.

The cost benefit analysis results are presented for two alternative scenarios:

- all grain rail lines open versus all grain rail lines closed; and
- keeping the GNR1000 lines open versus closing the GNR1000 lines.

Our assessment of “all rail lines closed” includes all rail lines. In contrast, the GIG report “Lines closed” refers to closing the GNR1000 lines only and therefore implicitly assumes that closing all lines is not an option. As a result of this assumption, the GIG report assumes $136m is required for re-sleepering for both the “Lines open” and “Lines closed” scenarios, thus implying the incremental cost of keeping the GNR1000 lines open is only $90m (i.e. $226m - $136m). However, it seems unlikely that you would invest to retain the GNR1000 lines, without investing to retain all lines (because the former generally feed into the latter) and thus the full $226m is required to keep the GNR1000 lines open. Notwithstanding this, we have used the GIG Report’s approach by separating out the investment to keep the GNR1000 open from the remainder of the network and reported only the re-sleepering costs for the GNR1000 lines despite this approach understating the likely full costs of keeping the GNR1000 lines open.

29 See Exhibit 14 page 24 GIG report
Table 5-3: Summary of costs and benefits

<table>
<thead>
<tr>
<th>Case</th>
<th>CBA Ratio “All lines Open”</th>
<th>CBA Ratio GNR1000 Lines open</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIG data and assumptions</td>
<td>0.39</td>
<td>0.72</td>
<td>The GNR1000 ratio is probably overstated because re-sleepering costs are unlikely to be fully captured.</td>
</tr>
<tr>
<td>Updated GIG data and GIG assumptions</td>
<td>0.37</td>
<td>0.65</td>
<td>The ratio for both scenarios have deteriorated slightly.</td>
</tr>
<tr>
<td>Including all costs and benefits</td>
<td>0.26</td>
<td>0.40</td>
<td>When all avoidable costs and benefits are included the ratio declines significantly under both scenarios.</td>
</tr>
<tr>
<td>Including all costs and benefits – Discount rates</td>
<td>4%: 0.241</td>
<td>n/a</td>
<td>Using more widely adopted discount rates shows a slight improvement in the results.</td>
</tr>
<tr>
<td></td>
<td>7%: 0.245</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10%: 0.247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Including all costs and benefits – External costs</td>
<td>0.34</td>
<td>n/a</td>
<td>Including external costs increases the ratio but not substantially.</td>
</tr>
<tr>
<td>Including all costs and benefits – Energy prices</td>
<td>See discussion</td>
<td></td>
<td>SAHA found road costs per tonne are more sensitive to changes in fuel prices than rail costs per tonne.</td>
</tr>
<tr>
<td>SAHA cost estimates</td>
<td>n/a</td>
<td>0.60</td>
<td>SAHA cost estimates suggest an improvement in the GNR1000 scenario. Sufficiently reliable estimates for closing all lines could not be developed due to a lack of data in the GIG report on the relevant variables impacting on these road costs.</td>
</tr>
<tr>
<td>Market share assumption</td>
<td>See discussion</td>
<td></td>
<td>Evidence suggests relaxing the “no leakage” assumption will worsen the business case.</td>
</tr>
</tbody>
</table>

The key features of the results under each approach are as follows.

- **GIG data and assumptions**: The findings indicate that overall, using the GIG data and assumptions, the costs of the proposed investment are likely to significantly outweigh the benefits for both scenarios. These findings should not be particularly surprising. The GIG analysis itself concludes that based on the resource costs of each line, several lines should be closed, but then recommends all lines should remain open.30 If more reliance is placed on

30 The GIG Report acknowledged the analysis shows the most efficient supply chain can be achieved by closing the Katanning-Nyabing, Tambellup-Gnowangerup and Merredin feeder lines, however concludes, “…the goal of short
some of the other material referenced in the GIG report, another basis of comparison is the total investment cost of $376m versus avoided annual costs of around $29m per annum.\textsuperscript{31} This, however, is also likely to produce a significantly negative outcome. See Appendix D for a detailed discussion of the data and assumptions underpinning this result.

- **Using updated GIG data:** WestNet Rail were the only stakeholders able to provide updated data. The results indicate incorporating WestNet Rail’s updated re-sleepering program worsens the case for the investment for both scenarios. See Appendix E for a detailed discussion of the data and assumptions underpinning this result.

- **Including all costs and benefits:** Including other avoidable capital and operating costs significantly worsens the case for investment. This case involved including other avoidable capital and operating expenditure for the below rail operator and accounts for changes to road maintenance costs following road upgrades. Including externality costs improves the case for investment slightly but not enough to generate positive net benefits, while using a higher discount rate actually improves the cost benefit ratio slightly. See Appendix F for a detailed discussion of the data and assumptions underpinning this result and Appendix J.2 for a broader discussion on discount rates.

- **Testing the impact of energy prices:** SAHA estimated the impact on road and rail costs per tonne at three sample sites and found road prices were more sensitive to fuel price changes. See Appendix F.5 and SAHA’s report in Appendix K for a detailed discussion.

- **Testing the GIG cost estimates and assumptions:** Including SAHA’s cost estimates improves the case for investment for the GNR1000 scenario however not enough to generate benefits that outweigh costs. See Appendix G and SAHA’s report in Appendix K for a detailed discussion of the data and assumptions underpinning this result.

At the branch line level, the results are similar, although there is some variation between them depending on the costs of re-sleepering the relevant line (e.g. its distance), and the corresponding costs that would otherwise be incurred on the roads. The uncertainty around these estimates are, however, particularly wide and should therefore be treated with considerable caution. Of themselves, it is not obvious that they provide a reliable basis for making decisions on the lines in which to invest.

\textsuperscript{31} Sd+ D conclude that total loss of the rail service to the grain industry would result in an additional 2.8 billion gtks being transferred by the road network and cost the community $28.6m per year ($23.3m in road wear and $5.3m in externality costs). This appears to include both local and state roads however Sd+D note the majority of the task would be on the sealed main road network (ibid Sd+D 2005, p99). Further, Parsons Brinckerhoff (2006) concluded that road maintenance costs would increase by $28.5m pa ($9.8m attributable to local roads) if rail lines with a 16 tonne axle restriction load were closed.
5.3 Testing the GIG market share assumption

This section examines the GIG assumption in relation to market share.

The GIG report, or at least the modelling that supports its conclusions, assumes that with the proposed investment in the rail freight network (and associated infrastructure) that there will be no leakage of grain freight from rail to road over the investment horizon. It states:

_In assessing the Network a critical assumption has been that no tonnes will “leak” to road._

In effect, this assumes that in terms of the market share of rail at port, it would remain at or around the current level (e.g. about 60 per cent) with or without the capital investment program. Further, a constant market dynamic is assumed between road and rail and that control of mode share will be contained within the pooling system. In addition, the GIG assumes current ports continue to operate and relative market share between the ports will remain the same. The market share of rail is likely to fall if measured in terms of net tonne kilometres. This is because it is implicit in the GIG proposal that some growers would transport grain for longer distances to get it to key receival points.

The GIG model adopts this assumption. The GIG report is, however, more equivocal on this point in parts, as it raises the issue of needing to reduce leakage and the need for a longer term perspective to encourage investment in rail grain supply chain to enable it to compete. For example, the GIG also states that the agreements to facilitate the investment would:

_require mechanisms to minimise leakage from the rail network while at the same time maintaining the benefits to growers of a network approach in order to induce new and renewal investments in the network._

This may be facilitated by establishing a single coordinator to minimise supply chain costs and reduce the risk of leakage. The GIG also appears to support:

_an industry wide approach to the cost recovery of at least the industry contribution of the future investment program even if this involved a regulatory approach._

This is consistent with our discussions with stakeholders. In short, the proponents of the investment typically did not appear to believe that, with the investment package alone, rail would maintain its market share. In other words, other mechanisms to require the use of rail would be required.

---

32 GIG, Grain Freight Network Review, p.20
33 The GIG report notes that rail accounts for 60% of grain transport in an average season, 70% in peak season and 50% in low season. It is also worth noting there is some variation in rail’s share across the ports whereby around 90% of grain is delivered by rail to the Kwinana port while the share to the other three ports is significantly lower. The rail share across the ports is approximately 53% at Albany, 46% at Geraldton and 14% at Esperance.
34 GIG, Grain Freight Network Review, p.vii
35 Ibid., p. vii
This conclusion appears to be driven by concerns about the underlying competitiveness of rail and that, without some form of long term commitment to rail, there would be limited incentive for parties in the rail freight supply chain to invest. In other words, with the risk of bypass and the longer term investment horizons required to invest in the rail freight supply chain, a longer term commitment to using rail would be essential to support the investment package. This, however, would also appear to highlight a key risk of investing in the rail network.

5.3.1 The basis for the market share assumption

The basis of this assumption is not explained in any detail in the GIG report. As a result, it is difficult to assess the reasoning for it. It is merely assumed that, with the investment package, there will be no leakage and the model outputs reflect this. Our consultations with key stakeholders did not provide further clarification of the basis for the assumption. Moreover, it is apparent that the users of rail grain freight services (i.e. growers and marketers), were not directly involved in the GIG process (however growers were initially represented by the AWB).

The assumption on market share is fundamental to the business case for the investment package. It is somewhat inconsistent with evidence indicating rail’s share is under increasing competitive pressure. It also predates the reforms to the wheat market with the introduction of the Wheat Export Marketing Act 2008 and Grain Express. It therefore does not contemplate the possible impact of these reforms.

Assessing the market share assumption is complicated by several factors:

- some of the changes to the market have only been introduced recently; and
- they have occurred at the same time as a number of potentially shorter term factors that may have been having considerable influence on the market. These include:
  - the cost of using rail continues to increase considerably, at least according to CBH;
  - the crop is particularly large this year;
  - there is excess capacity in shipping and much lower demurrage costs; and
  - there is extreme general economic uncertainty, which has increased the cost of capital and heightened aversion to risk (and financial risks in particular).

These all may be having some influence on the decisions growers and marketers are making. As a result, it is difficult to separate the extent to which recent activity in the market is being driven by changes in underlying dynamics of the market with deregulation or by these shorter term factors. The evidence that is available is therefore anecdotal in nature and draws in part on our consultations with stakeholders and growers and marketers in particular.
The remainder of this section examines the possible impact of the recent reforms on the key drivers of rail’s market share. This includes:

- the relative competitiveness of rail versus road, or the underlying risk of bypass; and

- changes in the industry structure and regulatory arrangements that might be facilitating and/or exacerbating the risk of bypass.

5.3.2 The underlying risk of bypass

This section examines the evidence for underlying risk of bypass (assuming no institutional and regulatory constraints).

Bypass occurs where a customer is able to get a similar service more cheaply than the incumbent is prepared to offer the service. Bypass can be efficient or inefficient:

- efficient bypass occurs when the customer’s stand-alone costs are below the service provider’s incremental costs (and price); and

- inefficient bypass occurs when the customer’s stand-alone costs are less than the service provider’s price but greater than service provider’s incremental costs (refer to Appendix H for a detailed discussion on the economics of bypass).

Evidence of the risk of bypass

As indicated, the evidence of the risk of bypass is primarily anecdotal and is described in considerable detail in SAHA’s report in Appendix K.

The evidence suggests the underlying risk of bypass is quite high. The key evidence includes:

- road freight is relatively cheap in WA and rail freight is comparatively expensive (see section 4.9 in the SAHA report in Appendix K for greater detail);

- rail is typically a price taker (and seeks to undercut road where it can). This is reflected in the sorts of load rail is currently serving. Rail tends to be most competitive for the long haul grain movements, but also deals with ‘surge’ volumes even though it is less well equipped to do so (i.e. it has lower variable costs that can be avoided when this capacity is not needed);  

- consistent with the above, the market share of rail has been falling over the longer term;

36 We understand that ARG may have increased charges over the past 2 years due to increased Access Charges by 30-50 per cent across the network, but cannot confirm this.
• stakeholders are widely of the view that rail is finding it increasingly difficult to compete. There would appear to be considerable partial bypass occurring;

• the degree of market consolidation. We understand that around 80 per cent of the grain is produced by about 20 per cent of growers.\(^{37}\) This implies that jointly the largest growers are likely to have the scale and financial capacity to invest to bypass the grain supply chain;

• the growth in on-farm storage (see section 3.3.4 in the SAHA report in Appendix K for greater detail), although a number of factors are contributing to this trend (i.e. greater harvesting capability, and the need for greater flexibility in the supply chain);

• CBH’s actions (e.g. pricing) which suggest that it is attempting to minimise the risk of bypass (see Appendix I for a discussion of CBH’s corporate structure and strategy); and

• The activities of the users of freight services, some of which we understand:
  - are in discussions with port authorities and have trialled a mineral loader to see whether it could be used to load grain;
  - are in discussions with a consortium to see whether their plans for a new break-bulk berth would have the functionality to load grain;
  - have contacted a port authority enquiring about opportunities to secure berth space for a potential temporary grain loader;
  - have begun exploring the suitability of an existing woodchip loader for loading grain; and
  - have examined the option of exporting more grain via containers.

On this basis, we conclude that the underlying risk of bypass is high.

5.3.3 Market deregulation and the risk of bypass

Market deregulation has the potential to both facilitate and exacerbate bypass, notwithstanding the outcomes that Grain Express seeks to encourage. They key changes are as follows.

There are now 23 wheat exporters operating in the market, resulting in a major realignment of market share in the WA wheat export market (refer Figure 5-5 and Figure 5-6 below). These export marketers are competing for the right to market and export grain and competing to get the best prices for their grain. This has resulted in a large proportion of Australia’s annual grain harvest being sold and shipped during the early months of the year, when world grain prices are

\(^{37}\) A variety of stakeholders suggested that this proportion was about right, although some argued that it was slightly higher or lower.
usually higher due to the lack of competing grain from Northern Hemisphere exporters. WADAF estimate that around 30% of grain was sold for cash this year, which could grow to around 40% over the next few years.

*Figure 5-5: Estimated shares of WA wheat market 2005-08, Emerald Group estimates*

![WA Wheat Market Share % Estimate 2005-08 (grower accumulated tonnes)](image)

Source: Emerald Group, presentation to Austock Agribusiness Conference, March 2009

*Figure 5-6: Estimated shares of WA wheat market 2009, Emerald Group estimates*

![WA Wheat Market Share % Estimate 2009 (grower accumulated tonnes)](image)

Source: Emerald Group, presentation to Austock Agribusiness Conference, March 2009

Export marketers and the growers they represent now have more individual and direct exposure to market prices than they did in the past (see section 3.1 in the SAHA report in Appendix K for greater detail). This exposure comes with the opportunity to make significant additional profit, but also the risk of losing revenues or incurring higher costs. It is reflected in demands for a change from production driven to demand driven supply chain solutions.

While Grain Express reduces the ability of growers and marketers to bypass the market, it does not remove it entirely.
These changes are by no means unusual in markets where competition and price deregulation has been introduced. Once introduced, parties respond to their individual incentives and prices reflect those incentives. This process works to remove cross subsidies. The electricity industry provides a good example of this as Appendix J.2 highlights.

The case study shows that competition and de-regulation typically alters the incentives in markets and leads to very different outcomes. The changes in the grain market may be different but they are likely to be substantial. Moreover, the electricity industry suggests that the changes that do occur are likely to occur quite quickly.

While it is difficult to predict how the grain market will evolve, the example highlights that the introduction of competition is likely to lead to fundamental changes in the market because (see section 3.1 of the SAHA report in Appendix K for a more detailed discussion of these issues):

- price volatility is now being priced differently and more appropriately;
- there are greater demands to exploit different prices for different qualities of grain; and
- there is a demand for more flexibility in the supply chain.

Rail is not particularly well suited to provide this flexibility, although it remains an important part of meeting total market demand.

The net effect is that growers and traders are likely to have a stronger incentive to bypass the system, if it is not delivering what they need in the new market.

**Conclusions**

The market share of rail is unlikely to be maintained for two reasons:

- the underlying risk of bypass would appear to be high; and
- market deregulation facilitates and exacerbates the risk of bypass.

This is not withstanding the ability of CBH to exert significant control over the supply chain through Grain Express and the apparent lack of cost reflectivity in the charges for services.

While much of the available evidence is somewhat anecdotal because the ability to bypass rail, at least partially, has only been introduced recently and there have been numerous other market developments occurring at the same time, that anecdotal evidence would appear to be strong.

The implication for the investment proposal is that, even with the investment package, the market share of rail is likely to fall, perhaps significantly. This will further undermine CBH’s ability to maintain market share through its charging structure. In practical terms, this means
that the benefits of investing in the rail network are likely to be lower than envisaged, because the investment in roads is likely to be required anyway (i.e. the business case for the investment is further undermined).

It is not, however, possible on the basis of the available information to estimate the extent to which the avoided costs and the benefits will fall. It is likely to make the benefit cost ratio worse because the investment in roads is likely to be required anyway. The fall in the avoided road investment costs would to some extent, however, be offset by an increase in above road costs, as more investment would be required in road haulage stock as its market share increased. In addition, it suggests that there would be significant risks associated with the investment, as it is it could be made redundant by the changes that are occurring in the market more generally.

38 There would not, however, be a lower corresponding reduction in rail rolling stocks costs as some capital would be made redundant and because the other avoidable costs (e.g. maintenance) are modest. We understand that the majority of ARG’s costs are fixed.
6 Investment options and risk analysis

This section:

- examines the potential investment options open to the Commonwealth Government and the risks associated with them, in light of the above findings; and
- develops a short term process to determine how it might make and implement a more robust decision to invest.

6.1 Investment options

There are a number of options available to the Commonwealth Government in assessing whether and how it might assist to facilitate the development of a more sustainable grain freight supply chain in Western Australia. The key options include the Commonwealth Government:

1. Participating fully, as proposed by the GIG, but based on more up to date cost estimates.

2. Declining to provide any funding for rail re-sleepering, although this would not necessarily preclude investing in roads (as is discussed below).

3. Supporting an investment program which includes investing in certain lines and associated road investment – where the investment case is strongest; and

4. Using funding either:
   - to encourage industry developments (e.g. reform) that might also assist in furthering the Commonwealth Government’s objective; and / or
   - to make the funding conditional on industry reform.

These options are not necessarily all mutually exclusive. Indeed, the option that is most consistent with the Government’s objective might well involve a combination of investment in:

- certain key rail lines;
- the State and Local Government road network; and
- facilitating reform of the rail grain freight supply chain.

We understand the Commonwealth Government’s key priority, at least in the context of this study, is to “facilitate the development of a more sustainable grain freight network in Western Australia.”
Australia”. This is the perspective we have brought to this review and assessing the investment options in particular. This perspective raises some key questions including:

- What would a more sustainable grain freight network or supply chain look like?
- What is the best means of delivering such a supply chain?
- To what extent do governments want to rely on the market to determine the nature of grain freight services that are provided (e.g. the extent to which it is road or rail)? How is the freight supply chain likely to evolve, if primary reliance is to be placed on market forces?
- Should rail and road freight be competing on a level playing field? If so, is the proposed investment in rail designed to level the playing field? Or is there a view that grain freight needs and warrants extra assistance because it provides other benefits that have not been captured in the analysis in this report? What should be the form of assistance, regulation (to rail) or incentives?
- In light of the above, what mechanisms are likely to be most consistent with facilitating the development of a more sustainable grain freight supply chain?
- What are the risks associated with those mechanisms?

Ultimately it is the role of government to make decisions on many of these matters. In light of the Commonwealth Government’s objective in the context of this study, however, it is perhaps worth noting the following key factors:

- grain freight is a relatively small part of the freight task, a task which road dominates in WA;
- rail and road already compete heavily for grain, but rail appears to be finding it increasingly difficult to compete. For rail, grain is its primary freight product outside the main lines, whereas, for road, grain is a relatively small and seasonal part of the market (i.e. the ‘icing on the cake’);
- market developments would appear to be further threatening the competitiveness of rail and unwinding these changes is difficult (e.g. customers value greater flexibility and are requiring the supply chain to become more customer, rather than production, driven);
- notwithstanding the above:
  - rail is likely to remain an important part of the grain freight task for the foreseeable future, as it provides significant capacity which in some cases would be difficult to provide by road, particularly given the expected growth in production. Rail and road can and do therefore compliment each other (as well as compete); and
there is a *prima facie* case for investing in rail to correct the ‘market failure’ created by the inability to price the use of regional roads appropriately, and create a level playing field between the two modes of transport. The analysis suggests that correcting for this externality is perhaps unlikely to change materially the competitive situation of rail;

- optimising the efficiency of the rail grain supply chain in isolation might not be consistent with customer needs or the Government’s objective. A more ‘expensive’ freight supply chain might in fact be more consistent with a higher value wheat supply chain, if it allows for the creation of additional value in other parts of the supply chain (i.e. customers may be willing to pay more for freight if it enables them to maximise their returns overall); and

- the rail grain freight sector has been waiting for a decision on government support for a number of years, and a number of track closures are likely to occur in the short term in the absence of investment. This uncertainty is inconsistent with the Government’s objective.

The above factors suggest that the criteria for assessing investment options should focus on:

- what is likely to deliver the most value to the users of the grain freight services (and should be transport mode or technology neutral);

- options that are most consistent with facilitating the development of the supply chain and the WA grain industry, given its current structure (i.e. works with how the market is evolving rather than trying to work against it); and

- resolving the pressing need to provide greater certainty to all players in the market in the short term, regardless of whether the Government chooses to invest or not.

Below we assess the key investment options and undertake an analysis of the risks associated with them.

### 6.2 Investment option assessment and risk analysis

#### 6.2.1 Participating as proposed by the GIG

This would involve supporting the GIG package as it stands and committing to fund the re-sleepering of the network, but based on more up to date cost estimates. It should also be noted in this respect, as section 6.2.4 highlights, that WestNet Rail has a revised investment program.

**General Risks**

The risks for government associated with investing in this option include:

- the probity of the investment process; and
WestNet Rail benefits only to the extent that the investment in re-sleepering results in better operational performance and that generates more traffic on the rail network.

These conditions would appear to apply to all the investment options to the extent they relate to investment in the rail network.

WestNet Rail previously invested public funds in a similar process as part of the Eastern Goldfields Railway Project. This work was undertaken as part of an agreement with the Public Transport Authority ("PTA"), the ultimate owner of the track. In this case, the funds would be held by the PTA and released on the basis of the costs incurred, provided the PTA is satisfied with the process that WestNet Rail has engaged in to manage the incurrence of those costs.

Our discussions with both parties suggested this would provide a good template for managing a new re-sleepering program, although we have not been privy to the Agreement. The PTA would therefore manage this process on behalf of the Government and has incentives to ensure that investment is undertaken with the long term value of the asset in mind.

The risk that WestNet Rail might be able to raise its charges to reflect the costs incurred (i.e. which it did not incur in the first instance) would also appear to be limited. The Economic Regulation Authority regulates WestNet Rail’s access charges for the use of its track, except where pre-existing contractual arrangements exist. The Economic Regulation Authority produces floor and ceiling prices to guide access negotiations. Those prices are set using an asset base calculated using a Gross Replacement Value Methodology. This methodology estimates the cost of replacing the network as a whole in new condition. As a result, it ignores capital expenditure except where it serves to increase the Gross Replacement Value of the asset (e.g. expands its reach). This means that the re-sleepering investment would not be taken into account in setting the floor and ceiling prices.

Other key risks

There are, however, a number of other key risks associated with this approach. Some of these risks relate to a number of the investment options to a greater or lesser extent (which are highlighted), but are discussed in this section because they are generally most relevant to this option and to provide context for the subsequent discussion of other options.

Estimated benefits not realised (particularly regarding the risk of bypass)

The most fundamental risk associated with this option is that the estimated benefits do not materialise because the road investment costs are not avoided (e.g. because they were unlikely

---

39 Clause 2 of Schedule 4 of the Railways (Access) Code 2000 defines the GRV as the gross replacement value of the railway infrastructure calculated as the lowest current cost to replace existing assets with assets that i) have the capacity to provide the level of service that meets the actual and reasonably projected demand; and ii) are, if appropriate, modern equivalent assets.
to arise in the first place and the market share assumption does not hold) and because the risk of bypass appears to be significant and increasing.

Based on the analysis of the available information this risk would appear to be significant.

The only way in which it could be mitigated would appear to be ‘regulating’ grain freight to rail. This could take the form of either:

- regulating to rail (e.g. requiring a certain market share to be maintained); or
- providing incentives to the industry to keep grain on rail (e.g. perhaps ‘bonus’ payments directed toward increasing rail’s market share).

There are likely to be a number of in principle and practical complications associated with these options. In principle, regulating to rail is inconsistent with the WEMA and competition policy more broadly. In particular:

- the object of the WEMA is to “promote the development of a bulk wheat export marketing industry that is efficient, competitive and advances the needs of wheat growers”. Thus encouraging competition in the industry is a key principle within the Act. Further, Part 9 Section 86A of the WEMA stipulates that no State or Territory laws can prevent a service contract for storage, handling or transport of grain for the purposes of export or trade. Thus any state laws that potentially reduce competition in the transport or storage and handling components of the supply chain could potentially be in breach of the WEMA.

- the Western Australia Transport Co-ordination Act (1966) may provide scope for requiring that certain products be transported on certain modes of transport. Division 3 Section 37 of the Act provides the Minister with the right to grant a commercial goods vehicle licence following review of several factors such as the condition of the roads and existing services for the carriage of the goods upon routes or within the area proposed. Thus theoretically, under this legislation the Minister may have the right to not grant a licence for transport of grain although this would seem somewhat incongruous given the extent of road transport's haulage of grain and the extensive route network for heavy haulage vehicles.

Regulating to rail would also appear to be inconsistent with the Government’s broader direction of Government policy which has been more consistent with deregulating the export of bulk grain. Given the trend toward greater deregulation of the market, this would seem to represent a step in the opposite direction. Based on our consultations with key customers groups, such a step would be very poorly received.

This approach would not be the most appropriate way of addressing the underpricing of roads (which should be addressed by the primary intervention). Indeed, it would appear to be predicated on the assumption that the underlying investment is not economic in its own right (i.e. would not make rail competitive).
There are also likely to be a number of practical problems associated with this approach. For example, appropriately measuring market share to ensure use of the relevant assets (e.g. they might need to be set at a line level otherwise the market share could be reached by carrying more grain on more commercial lines). Other issues would relate to ensuring compliance and putting in place appropriate sanctions for non-compliance (e.g. such as reimbursing the funding or part of the funding).

An incentive based approach may overcome some of these problems, but it is also likely to suffer from similar, but more significant, practical problems as regulating to rail. Such incentives are likely to be very difficult to design, measure and set at a level that provide the right incentives for the assets.

In summary, there are likely to be significant complications with mitigating this risk and ensuring the benefits are realised.

**Risk of keeping re-sleepered lines open**

If Government subsidises below rail investment, how does it guarantee that the lines will remain open and other investment will occur? We understand that, under the terms of the lease agreements (“the Agreement”) WestNet Rail has with the PTA\(^{40}\), it can surrender lines back to the Government under certain conditions. Although we have not been privy to the Agreement, we understand that the key conditions are that:

- several key lines cannot be surrendered (but are unlikely to be anyway in the foreseeable future);

- for other lines, the lessee may request termination of the Agreement if:
  - there has been a significant reduction in use;
  - the continued maintenance for the following three years would be uneconomic (i.e. future maintenance costs, including capital expenditure, is expected to exceed revenue); and

  - the lessee is capable of performing its obligations under the Agreement if the line was no longer in use;

- for a line to be surrendered it must be a line between end points and the lessee must demonstrate with specific information (such as gross freight tonnes, access revenue, and capital and maintenance costs) that it meets the above conditions; and

\(^{40}\) Rail Freight Corridor Land Use Agreement and Railway Infrastructure lease, Narrow Gauge and Standard Gauge.
• if the surrender test is met, the Minister must terminate the Agreement with respect to the line (take back control) or propose a subsidy for maintenance.

More importantly, we understand that both WestNet Rail and the PTA are of the view (but necessarily the same view) that a significant number of the grain lines already meet these conditions and could therefore be surrendered at short notice. We have not seen information that would enable us to form a judgement on these matters.

Therefore, if the Government wanted a guarantee that the tracks that were re-sleepered were not surrendered, it would need to either renegotiate these lease terms or come to another agreement that overrides these conditions.

Even if it did so, however, it is not obvious how government could force these rail lines to be used (except as described below), so the practical benefit this could provide may be limited. While it perhaps could ‘force’ WestNet Rail to keep them in operational condition under the Lease Agreement, which we understand would impose some costs on WestNet Rail, it is not obvious how government could force CBH to use rail.

**Investment risk of associated investment not proceeding**

There is also a risk that the associated investment to keep rail competitive, as outlined in CBH’s strategy would not proceed. We have not been able to establish from CBH its intentions regarding its investment strategy or how much of the investment program it has already undertaken. According to the GIG review we understand CBH intends to make most of this investment anyway, although its form may alter to some degree if the re-sleepering investment did not occur. On this basis the risk would appear to be reasonably modest.

Nevertheless, it is likely to be prudent to gain some form of commitment from CBH and perhaps ARG surrounding their intentions if the investment program proceeds (perhaps regardless of its form). The GIG report provided a proposed investment agreement.\(^{41}\)

Ensuring compliance and putting in place appropriate sanctions for non-compliance with such an investment agreement is likely to be problematic if the associated investment proves to be contrary to the commercial interests of the parties (as discussed above in relation to the estimated benefits not being realised).

**Broader business and policy risks**

There are a variety of other broader risks associated with the option of participating as proposed by the GIG (although some apply to a number of the other options).

\(^{41}\) See Appendix 10 GIG Report.
• Capital market environment – The market does not support the associated investment program or only at a prohibitive cost. The original GIG investment program was developed at a time of more benign capital market conditions.

• Changes in business ownership – There is a risk that changes in business ownership or ownership structure might impact on their incentives. For example, there is some uncertainty around WestNet Rail’s ownership. CBH might also alter its ownership structure (as it seems to be of questionable suitability in a deregulated market), or strategies. Agreements may mitigate to some degree the risk that a new owner or new strategy could involve taking a different view about the merits of investing in the rail network or improving the competitiveness of rail, but it is not obvious that this risk can be managed very effectively. This is particularly the case if the course of action is inconsistent with their commercial incentives.

• Changes in the policy/legislative environment – If other changes in the policy environment change (e.g. Grain Express ‘fails’) and gives customers more flexibility to determine how they freight grain, the investment to improve the competitiveness of rail may be less effective. Governments can to some degree mitigate this risk by influencing the development of policy, but some of it is outside their control.

• Climate change impact on production - Climate change impacts on crop production may change the aggregate level of demand for transport and also the distribution of transport needs across the region (e.g. closer to the coast and the ports or areas not well serviced by rail currently, such as the Esperance region).

This option is difficult to recommend on the basis of the analysis contained in this report.

6.2.2 Declining to providing any funding for rail re-sleepering

The option would involve declining to offer any funding for rail re-sleepering and not proposing to make any other investment in its place.

The key risks associated with this approach are:

• the rail system fails sooner than expected. Branch lines are closed and this places considerable additional freight on roads in the shorter term and results in significant congestion and other external costs, and damages grain export performance; and

---

42 BBI has recently announced (22 April 2009) that no bids for WestNet Rail are actively under formal consideration but ongoing discussions with interested parties are continuing. They note that the earliest financial close for any transaction would not be before end of fourth quarter CY2009 (due mainly to the regulatory approval process timeframe). Refer BBI website, http://www.bbinfrastructure.com/media/411961/22.4.09%20asset%20sales%20&%20performance%20update.pdf
• the political risks associated with what might be perceived to be a lack of support for the rural sector. This might lead to a need for additional road investment.

This option is consistent with the analysis contained in this report. It would, however, not be without risk and it may be inconsistent with the Government’s broader policy objectives.

6.2.3 Supporting partial rail investment

The option would involve being prepared to offer funding for a more modest program of investment designed to preserve certain key lines under a more concentrated ‘hub and spoke’ concept, with those key rail hubs served by road.

This investment could also go beyond re-sleepering investment (e.g. building standard gauge line, although this option is likely to be expensive and not examined in any detail in this report).

The key risks associated with this approach are that:

• on the basis of the lack of detail provided by the key supply side stakeholders to this review, it is not obvious what those investments would be and further analysis and a process to establish the terms of this investment would be needed; and

• there would still be a risk that these lines could be bypassed. For example, closing some lines may mean that higher fixed costs may need to be recovered from other lines, which may further reduce the competitiveness of these lines (e.g. particularly if the providers of rail freight services do not re-price their services). Ironically, if rail’s competitive disadvantage is as bad as some suggest, this approach could actually increase the risk to its market share. This is because road transport operators may change how they provide services, including the investment they make. These changes may influence how they choose to compete and price their services (e.g. they may reduce prices for long haul journeys).

Final consultations with key members of the industry have indicated that the industry could quickly produce a revised investment plan based on a “hub and spoke” concept that would involve:

• investing to save around 35 per cent of the lines (we understand this may include the Albany, Western Geraldton and Koorda lines or parts thereof);

• road investment to facilitate further farm to bin travel; and

• possible investment in rolling stock.

Such an approach would be more consistent with the findings of the analysis in this report. It could only be recommended, however, on the basis of a more detailed examination of the
benefits of investing to maintain certain rail lines. There are some risks with this approach also. The two most obvious are that it is not possible to get agreement with customers about the merits of a revised investment package. There is also a risk that, if it is not managed correctly, it may introduce further time delays and additional investment uncertainty. The proposed implementation plan is designed to address these risks.

6.2.4 Tying funding to industry reform or using funding for industry reform

The final option would be to use or tie funding to supporting industry reforms that would also assist in facilitating the development of a more competitive grain freight supply chain. Our consultations have strongly suggested that customers have major concerns about the efficiency and effectiveness of the current supply chain arrangements, particularly the behaviour and actions of CBH.

The industry reforms that customers are likely to seek could range from:

- commitments from all industry participants to work together to promote and implement a more efficient grain freight supply chain;
- commitments by CBH to introduce greater transparency and accountability in the operation and process of Grain Express;
- the introduction of more transparency in CBH’s charges including demonstrating the degree to which they are cost reflective, perhaps as part of the development of access arrangements that go beyond the minimum requirements;
- greater separation of CBH’s trading and logistics operations arms;
- a commitment by CBH to put a corporate and/or ownership restructure to its shareholders, and perhaps providing incentives for it to do so; and
- potential arrangements to provide industry participants with incentives to meet their commitments under the plan, although developing such arrangements is likely to raise practical issues.

There are a couple of activities occurring currently that may be relevant to these considerations. These include:

- WEMA requires accredited exporters that operate bulk grain terminals to publish their shipping programs and port terminal access terms and conditions for other grain exporters. Following 1 October 2009, these exporters are required to enter into an ACCC-approved access undertaking under Part IIIA of the Trade Practices Act. CBH has submitted its draft access arrangement to the ACCC which was recently published, along with an Issues Paper, on the ACCC website for public consultation; and

© 2009 KPMG, an Australian partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International, a Swiss cooperative. All rights reserved. The KPMG logo and name are trademarks of KPMG. Liability limited by a scheme approved under Professional Standards Legislation.
- The Productivity Commission is to commence its review of the WEMA no later than January 2010. We understand the Terms of Reference for the review will be developed over the coming months.

There would appear to be grounds for considering industry reforms as part of a package of measures designed to facilitate the development of a more sustainable grain freight supply chain. These grounds are based on the potential to improve the price signals in the current supply chain and the concerns users of grain freight services have raised during this review.
7 Proposed Implementation plan

This section outlines an approach to produce a revised investment plan to facilitate the development of a more sustainable grain freight supply chain in WA. It involves the creation of a ‘WA Grain Freight Investment Committee’ (“the Committee”) to drive a focused, short-term process (up to three months) to produce the revised investment plan.

The key objectives of the implementation plan are to ensure that:

- Government and industry participants agree a revised investment plan prior to the commencement of the 2009-2010 harvest (by October 2009) to allow execution of the investment to commence no later than May 2010. This would end the long period of uncertainty the industry has faced in relation to the Government’s intentions;

- both the supply and demand sides of the industry have representation on the Committee and adequate input into the development of the plan;

- it encourages industry reform that is consistent with how the market is evolving and would contribute to the development of a more sustainable grain freight supply chain; and

- it has an independent Chair would be appointed to ensure the critical milestones are achieved.

It would differ from the GIG process in respect of the timing, the greater involvement of users of grain freight services, the greater involvement of the Commonwealth Government and broader WA Government representatives and the degree of transparency it provides.

The following section provides an indicative guide to the key tasks and timing required to meet the above objectives. A Gantt Chart (refer Figure 7-1) details the proposed tasks and timing.

---

43 We understand that WestNet Rail requires a period of up to eight months for planning prior to the commencement of re-sleepering works, based on the scope of works outlined in the GIG report. This planning period therefore may be shortened due to smaller scope of work that is likely to be proposed under the revised investment plan.
7.1 Key steps

7.1.1 Project initiation

The critical milestones in this step include:

- Seeking endorsement on the proposal to establish the Committee to oversee the development of an enhanced WA grain freight supply chain from:
  - the Parliamentary Secretary for Regional Development and Northern Australia (the Hon Gary Gray MP);
  - the Commonwealth Minister for Infrastructure, Transport, Regional Development and Local Government (the Hon Anthony Albanese MP);
  - the Commonwealth Minister for Agriculture, Fisheries and Forestry (the Hon Tony Burke MP); and
  - the WA Minister for Transport (the Hon Simon O’Brien MLC).

- Announcement of the process following Ministerial endorsement, and with any potential funding conditional upon satisfactory completion of the process.

- Appointment of a Chair to lead the process.

- Inviting participants from both the supply and demand side of the supply chain to be involved as members of the Committee through a joint letter from the Commonwealth and WA Governments.

The Ministerial brief on the proposal would provide detail on the:

- Terms of Reference;
- membership of the Committee;
- key tasks and decision making process;
- timing; and
- conditions of membership (i.e. ‘open book’ process).

The Terms of Reference should, in addition to outlining the process, outline the key objective: “to facilitate the development of a more sustainable grain freight supply chain in WA”. To give
effect to this objective, the independent chair in collaboration with the Committee could be invited to:

- establish the broad parameters of an efficient and sustainable grain freight supply chain in WA;
- develop a revised investment plan in the WA grain freight supply chain for consideration and approval by the Commonwealth and WA Governments; and
- identify other industry reforms that may further assist in the development of a more sustainable, open and transparent WA grain freight supply chain.

The composition, roles and powers of the Committee would need to be agreed by the Commonwealth and WA Governments. At a minimum, the Committee should have an independent chair who would work in collaboration with Committee representatives who should be drawn from the following parties:

- Rail Grain Freight Service Providers:
  - CBH
  - WestNet Rail
  - ARG
- Grain Freight Customer Representatives, perhaps drawn from:
  - Grain Industry Association of WA (GIWA)
  - Australian Grain Exporters Association (AGEA)
  - Pastoralists and Graziers Association (PGA)
- Other affected parties:
  - Australian Truckers Association (ATA) and / or the Western Australian Transport Forum
- Government:
  - Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government
  - WA Department of Planning and Infrastructure
  - WA Department of Main Roads
  - WA Local Government Association
  - Public Transport Authority
- National Transport Commission

The role of the independent chair, in collaboration with the Committee, would be to deliver on the Terms of Reference outlined above and provide a recommendation to Government. The Committee’s powers would be limited to involvement in presenting a revised investment plan to Government for consideration, but if prudent could also play an ongoing role in overseeing implementation of its recommendations.

7.1.2 Development and presentation of a revised investment plan

The supply side members of the Committee (CBH, WestNet Rail and ARG) would be responsible for jointly developing a revised investment plan for the WA grain freight supply chain and presenting this to the Committee for consideration.

The Grain Freight Service Providers have already indicated that they are well placed to present a revised investment plan at short notice.

The revised investment plan would need to include:

- detail on the location of the proposed investment in rail re-sleepering and road upgrades;
- analysis of the costs, benefits and risks associated with the proposed investment on an ‘open book’ basis;
- an implementation plan for the investment outlining the key steps to be undertaken and the indicative timing, roles and responsibilities for planning, construction and commissioning;
- a commitment to their associated investment programs; and
- any recommendations that they are prepared to make on industry reform.

Committee members would be provided with the revised investment plan to review two weeks prior to a meeting where members would discuss the merits of the proposed investment.

7.1.3 Review of the revised investment plan

The Committee would then be asked to review the plan and provide comments on it. It is likely that, as part of this process, customer representatives would at a minimum be seeking to float a number of industry reform proposals from encouraging CBH to introduce greater transparency into its operations to more substantive industry reform. Indeed, it seems likely that when provided with the Terms of Reference, they would formulate their proposals.

A further revised investment plan (based on comments from the Committee’s initial review) would then be subject to another review by the independent chair in collaboration with the
Committee to verify that the proposals would be consistent with meeting the Government’s objective. In the absence of agreement, the independent chair may decide on the investment plan that is assessed.

7.1.4 Presentation of investment plan to Government

The independent chair would be responsible for reporting to the Commonwealth and WA Governments on the Terms of Reference for the proposed implementation plan. In addition, the independent chair would be responsible for submitting that plan to the Commonwealth and WA governments for consideration and approval.

We note that the proposed timeline outlined below allows an additional few weeks should Government require further time for negotiations.

We believe that with the commitment of all stakeholders these timelines would be achievable and are desirable.
### Figure 7-1 Proposed Committee Review Timeframe

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Endorsement by Minister / Parliamentary Secretary of proposed approach</td>
<td>M W F</td>
<td>T T S</td>
<td>M W F</td>
<td>S T T S</td>
<td>M W F</td>
<td>S T T S</td>
<td>M W F</td>
<td>S T T S</td>
<td>M W F</td>
<td>S T T S</td>
</tr>
<tr>
<td>2</td>
<td>Endorsement by WA Minister for Transport</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
<td>Cwth Govt</td>
</tr>
<tr>
<td>3</td>
<td>Appoint independent Chair</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
<td>CBH, WNR, ARG</td>
</tr>
<tr>
<td>4</td>
<td>Invite Committee members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Presentation of investment plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Review investment plan documentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Committee Meeting - discuss investment plan with Independent Chair to summarise and determine response</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Amendment of investment plan (if required)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Review of revised investment plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Independent Chair submits revised investment plan to Government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Government review of revised investment plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Government decision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2009 KPMG, an Australian partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International, a Swiss cooperative. All rights reserved.

The KPMG logo and name are trademarks of KPMG.

Liability limited by a scheme approved under Professional Standards Legislation.
## Stakeholders consulted during this review

<table>
<thead>
<tr>
<th>Group</th>
<th>Organisation</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Infrastructure Group</td>
<td>ARG</td>
<td>Ben Campbell, National Manager Commercial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ken Potts, Group General Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eddie McLeish, Marketing Manager Grain</td>
</tr>
<tr>
<td>WestNet Rail</td>
<td></td>
<td>Paul Larsen, General Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nathan Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allan Rose, Commercial Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adam Sidebottom, Senior Commercial Analyst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paul Lowney, Manager Business Development and Special Projects</td>
</tr>
<tr>
<td>CBH</td>
<td></td>
<td>Grant Thompson</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Owen Davies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Michael Poole</td>
</tr>
<tr>
<td>WA Department for Planning and Infrastructure</td>
<td></td>
<td>Mr Drew Gaynor, Director Freight Logistics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>John Georgiades, Freight and Logistics Advisor, Transport Industry Policy</td>
</tr>
<tr>
<td>Department and agencies</td>
<td>ACCC</td>
<td>David Hatfield</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sarah Sheppard</td>
</tr>
<tr>
<td></td>
<td>DAFF</td>
<td>Des Naughton, Head of Crops Branch, Agricultural Productivity</td>
</tr>
<tr>
<td></td>
<td>ABARE</td>
<td>Leanne Laurence, Commodity Analyst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>John Hogan, Commodity Analyst</td>
</tr>
<tr>
<td></td>
<td>WA LGA</td>
<td>Michelle MacKenzie, Director Transport</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bill Mitchell, President</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ian Duncan, Economist</td>
</tr>
<tr>
<td></td>
<td>WA Department of Treasury and Finance</td>
<td>Dave Morrison, Principal Policy Officer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Matt Stubbs</td>
</tr>
<tr>
<td></td>
<td>Wheat Exports Australia</td>
<td>Peter Woods, CEO</td>
</tr>
<tr>
<td></td>
<td>WA Department of Agriculture and Food</td>
<td>Ian Longson, Director General</td>
</tr>
<tr>
<td>Main Roads</td>
<td></td>
<td>Peter Metcalfe, Director Grain Industry Development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>John Rossiter, Heavy Vehicle Access Planning Manager</td>
</tr>
<tr>
<td></td>
<td>PTA</td>
<td>Sue McCarrey, Executive Director Safety and Strategic Development</td>
</tr>
<tr>
<td>Economic Regulatory Authority WA</td>
<td></td>
<td>Ross Hamilton, General Manager Network and Infrastructure</td>
</tr>
<tr>
<td>Farmers</td>
<td>The Western Australian Farmers Federation (WA Farmers) (Inc.)</td>
<td>Mike Norton, President</td>
</tr>
<tr>
<td></td>
<td></td>
<td>John Hassal, Vice President Transport</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chris Wyhoon, Executive Officer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deborah Whitfield, Grains Executive Officer</td>
</tr>
<tr>
<td></td>
<td>Wheat Growers Association</td>
<td>Peter Wells, Executive Officer</td>
</tr>
<tr>
<td></td>
<td>Pastoralists and Graziers Association of Western Australia</td>
<td>Leon Bradley, Chairman (Grains)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sheldon Mumbay, Executive Officer</td>
</tr>
<tr>
<td></td>
<td>Grain Growers Association</td>
<td>Peter Flottman, CEO</td>
</tr>
<tr>
<td>Group</td>
<td>Organisation</td>
<td>Name</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Grain Industry</td>
<td>Grain Industry Association of WA</td>
<td>Tony Critch, Chair</td>
</tr>
<tr>
<td>Research</td>
<td>GRDC</td>
<td>John Duff, Executive Officer</td>
</tr>
<tr>
<td></td>
<td>Maunsell Aecom</td>
<td>Mark Gilpin, Principal Rail Engineer</td>
</tr>
<tr>
<td>Road transport</td>
<td>Australian Truckers</td>
<td>David Coonan, National Manager, Policy</td>
</tr>
<tr>
<td></td>
<td>Transport Forum WA</td>
<td>Ian King, Chief Executive Officer</td>
</tr>
<tr>
<td></td>
<td>Australian Livestock and Transporters Association</td>
<td>Luke Fraser, Executive Director</td>
</tr>
<tr>
<td></td>
<td>Mack Trucks</td>
<td>Peter Clemson</td>
</tr>
<tr>
<td></td>
<td>Muscat Trailers</td>
<td>Troy Asperati</td>
</tr>
<tr>
<td></td>
<td>Bulk grain transport central wheatbelt owner driver</td>
<td>Anonymous</td>
</tr>
<tr>
<td></td>
<td>Matthews Transport</td>
<td>Neville Matthews</td>
</tr>
<tr>
<td>Ports</td>
<td>Albany</td>
<td>Brad Williamson, CEO</td>
</tr>
<tr>
<td></td>
<td>Geraldton</td>
<td>Peter Klein, CEO</td>
</tr>
<tr>
<td></td>
<td>Fremantle</td>
<td>Doug Brindal, Manager Logistics</td>
</tr>
<tr>
<td>Other - Grain Marketers</td>
<td>Louis Dreyfus Australia Pty Ltd</td>
<td>Alick Osborne</td>
</tr>
<tr>
<td></td>
<td>Cargill Australia</td>
<td>Robert Green</td>
</tr>
<tr>
<td></td>
<td>Glencore Grain</td>
<td>David Mattiske, CFO</td>
</tr>
<tr>
<td></td>
<td>Grain Corp</td>
<td>James Moore, Trading Manager</td>
</tr>
<tr>
<td></td>
<td>Premium Grain Handlers</td>
<td>Neil Johns, Business Development Director</td>
</tr>
<tr>
<td></td>
<td>ABB Grain</td>
<td>John Orr, General Manager</td>
</tr>
<tr>
<td></td>
<td>AWB</td>
<td>Mark Cooney, Manager Corporate Relations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Matthew Watt, General Manager Rail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sasha Grebe, Trade Advocacy and Government Relations Manager</td>
</tr>
</tbody>
</table>
B  GIG costs and benefits

In relation to costs, the GIG report identifies potential investment in:

- the rail network in the form of re-sleepering of lines by WestNet Rail to maintain the integrity of the rail network;
- receival sites (e.g. loading, rail and road access) by CBH to improve the rail loading times;
- certain State roads that service the rail network system (typically by State Governments) to facilitate the use of the rail network; and
- above rail rolling stock (ARG) and the incurrence of operating and maintenance costs.

In addition, there may be some other potential changes in operating costs (either reductions where assets have been replaced or increases where additional assets have been created).

In relation to benefits, the GIG report identifies potential:

- avoided investment primarily in the main road network (primarily to the benefit of the State Government), which otherwise would be required either to upgrade the road network to deal with the extra freight traffic and / or to maintain the condition of the road network, given that it would be handling more grain freight and suffer from more wear and tear;
- avoided investment in above road rolling stock; and
- avoided external costs associated with greater use of roads (borne by the community at large). We understand that these external costs take the form of:
  - economic – greater road congestion and delays;
  - safety – more frequent accidents involving grain freight vehicles;
  - social – loss of life and impacts on regional communities\(^\text{44}\), and
  - environmental – such as greater use of fuel and therefore higher carbon emissions etc.\(^\text{45}\)

There may also be efficiency and service level improvements associated with the investment in rail freight network (e.g. operating regimes and speeds).\(^\text{46}\)
C **Factors influencing our approach**

This section discusses in more detail the rationale behind our approach as was outlined in section 5.1.

*Three discrete investments*

As discussed in section 5, the investment package contains three discrete types of investments we have sought to isolate:

- the investment in re-sleepering - which is necessary to maintain the integrity of the rail network (i.e. so that it can be used at all). Absent this investment, we understand that, over the next few years, a number of lines would, for all practical purposes, become unusable or only usable within tighter constraints (e.g. operating regimes and speeds) until they become unusable. This investment is therefore primarily driven to enable the continued use of rail;

- the investment in the rail receival facilities (and associated feeder roads) - which is necessary to improve the efficiency of rail loading so that it is more competitive with road freight. This investment is therefore necessary to maintain the competitiveness of rail freight. In other words, it is primarily about maintaining market share. We understand that CBH is proposing to make this investment anyway, although its form might change somewhat absent the re-sleepering program; and

- the investment (or avoided investment) in above rail and road rolling stock and the associated operating and maintenance costs - which is about the competitiveness of rail versus road *above ground*, given the condition of the below ground infrastructure. In other words, it is also primarily about maintaining market share.

Given this, it is appropriate to examine the re-sleepering investment in isolation in the first instance. This could be done by comparing the cost of the investment with the benefits (i.e. the avoided investment in roads). This would also be consistent with what the Commonwealth Government is being asked to help fund.

*Separating benefits and market share implications across the three discrete investments*

As section 5.1.1 illustrates, however, this is difficult in practice because the benefits of the investment are only analysed at the level of the entire investment package. In other words, the GIG report does not identify how much the market share of rail would (presumably) fall, with the re-sleepering investment, but without the investment in the grain receival facilities. The GIG report therefore does not identify the benefits of the re-sleepering investment (i.e. the avoided costs of investing in roads) in isolation. This seems to be an important oversight.

---

*This is also likely to be true of investment in the road network, and the actual benefits will depend on constraints in other parts of the system (e.g. on the standard gauge network in the Kwinana region or at ports).*

file 1.doc
The economic benefits (i.e. the avoided costs) identified by the GIG are therefore also dependent upon the investment in the rail network ensuring that rail maintains its market share (i.e. the market continuing to use rail freight). If the investment in rail does not achieve this outcome, road freight use will be greater in any case, and at least some of the costs of using the road network more would be incurred anyway. The key economic impact of this outcome is that the avoided costs identified above would be lower, making the investment in the rail network less attractive from an economic perspective.

Assumptions on market share

The GIG report therefore also implicitly assumes that, with the investment package, the above ground rail and road costs of delivering a similar service are competitive; indeed, one of the key purposes of the model is to demonstrate this. This conclusion is consistent with the view that rail is capable of maintaining its market share. In other words, provided the use of the road network is appropriately ‘priced’ (i.e. on an equivalent basis perhaps by subsidising the rail freight network), rail freight is competitive above ground. This suggests that the life cycle ‘rolling stock’ costs of freighting by rail or road are competitive on average.47 The actual use of the two options would, in practice, be determined by the outcomes of the competitive process and the particular circumstances relating to each decision to use one or the other form of grain freight.

The assumption about the competitiveness of above ground rail freight costs appears, in practice, to be essential to retain the internal consistency underpinning the investment proposal. In other words, if this does not hold (e.g. with networks of similar quality to use and prices determined on a level playing field, rail freight is not competitive), then by definition the investment should not proceed.

This suggests that, while above rail and road costs are important considerations in assessing the relative competitiveness of the two options (e.g. relevant to pricing decisions), they are not relevant to the underlying investment decision in the first instance.

Investment in local roads not included in analysis

The costs associated with investing in local roads are ignored on the basis that these costs would be incurred under either scenario (given CBH’s investment strategy). We understand that CBH’s strategy might look somewhat different in the absence of the rail investment (i.e. it might consolidate into fewer sites). This might imply further traffic on local roads or at least traffic moving by road for longer distances (and thus higher and avoidable costs). We have not been able to establish the extent to which CBH’s investment might change absent the

47 There might also be some other benefits associated with maintaining the use of rail freight, although the net economic implications are likely to be particularly difficult to predict. For example, without the proposed investment, there would be a need for greater investment in road ‘rolling stock’ over time, but the need to replace existing rail rolling stock would over time be correspondingly reduced. In practice, the cost structure of road and rail freighting are different as well (e.g. the break-down on capital and operating costs), so this would lead to somewhat different economic impacts under the two scenarios (e.g. road ‘rolling stock’ operating costs would be avoided). The net impacts over the life cycle of the two investments are therefore likely to be particularly difficult to predict.
investment in the rail network, and thus whether there would be additional traffic on local roads in terms of net tonne kilometres.
D GIG cost benefit analysis

This section presents the results from the GIG report and modelling of the proposed investment package. In other words, no attempt is made to test the veracity of the GIG data or assumptions when assessing the investment proposal on this basis. The source of the data used in the assessment and any assumptions underpinning the results are identified and discussed.

Table D-1: Results using GIG data and assumptions

<table>
<thead>
<tr>
<th></th>
<th>All lines open v. All lines closed</th>
<th>GNR1000 open v. GNR1000 closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs</td>
<td>$375,701</td>
<td>$193,590</td>
</tr>
<tr>
<td>Total benefits</td>
<td>$145,573</td>
<td>$139,913</td>
</tr>
<tr>
<td>Benefit cost ratio</td>
<td>0.39</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Table D-1 shows, on the basis of GIG data and assumptions, that:

- the costs of the investment package substantially outweigh the benefits both for the:
  - all lines open versus all lines closed; and
  - GNR lines open versus the GNR lines closed;

- the results vary only because not all the costs that may otherwise be incurred on the roads have been captured in the all lines closed example, but it is open to question whether those costs would be significant; and

- if the focus is only on the cost of re-sleepering versus the road costs that otherwise would be incurred, the results using the GIG assumptions are:
  - Scenario one - all lines open versus all lines closed; and
  - Scenario two - GNR lines open versus the GNR lines closed, although it is questionable whether this is a relevant comparison as discussed above the re-sleepering cost for the GNR1000 lines is more likely to include the full amount.

In addition, as discussed below, there are a number of reasons to question whether the benefits would in practice be realised.

To interpret these results it is, however, important to note the data and assumption qualifications underpinning each cost and benefit.
D.1 Costs

Re-sleepering
The GIG model estimates re-sleepering costs of around $200m to maintain the entire grain rail network.\(^{48}\) The GIG model estimates the NPV of re-sleepering the GNR1000 lines at less than half of this amount.\(^{49}\)

Storage and handling
The GIG report refers to $147.6m in storage and handling investment (rapid rail loading cost $106.8m and road and rail access $40.8m) for both the all lines open and closing the GNR1000 lines.\(^{50}\) Table D-1 uses the NPV for all lines open and extracts the portion of this relevant to the GNR1000 lines.

According to the GIG report, the CBH investment will be undertaken regardless of whether the lines are closed or remain open, therefore indicating the storage and handling costs should not be included as an incremental cost in Table D-1. However, given the avoidable road costs are based on the assumption of rail maintaining its market share, and the storage handling investment is necessary to meet this assumption, it is included in the analysis to ensure that all the relevant costs and benefits are considered.

State road upgrades
The GIG report estimates about $63.2m (2007 $) is required for state road upgrades. The road costs for the GNR1000 scenario is the same as the all line open scenario as the lines requiring road upgrades are all associated with GNR1000 rail lines.

As with the storage and handling costs, these costs are equally incurred in both scenarios because they involve upgrading roads to serve CBH’s more consolidated facilities.

D.2 Benefits

Avoided road costs
The GIG report estimates about $151.4m (2007 $) would otherwise be required for state road upgrades. This cost is broadly consistent with the GNR1000 scenario.

In respect of our “all lines closed” scenario, it therefore seems reasonable to assume that the avoided road costs are understated (as Table D-1 indicates). This is because some additional

\(^{48}\) The re-sleepering costs are based on several assumptions including that all “active” rail lines need major investments every 10-15 years to replace failing sleepers, upgrade ballast and improve stability.

\(^{49}\) This figure was calculated from the GIG model by summing the re-sleepering costs required for the GNR1000 lines.

\(^{50}\) Exhibit 14, page 24 GIG Report.
investment is likely to be required to upgrade the other rail lines which are currently
transporting the grain freight, but would close in this scenario.

The extent of this understatement is, however, difficult to estimate. This is because the roads
that would be impacted by closing the rail lines not included in the GNR1000 may be mostly
major highways (such between Wagin and Albany) and may therefore be less likely to require
major upgrades.

Avoided external costs
The avoided external costs have not been included in Table D-1 as according to the GIG
modelling they are negligible. In fact, Appendix 9 of the GIG report identifies that under the
GNR1000 scenario the external cost of closing those lines is slightly higher than keeping them
open.

This is surprising given the GIG modelling used the Sd+D unit cost assumptions for calculating
the externalities and it found closing the entire grain network would impose external costs of
$5.3m per annum.51 The Sd+D result appears to be the source of the $6m per year externality
costs the rail network currently saves identified elsewhere in the GIG report.52

D.3 Key issues
Several assumptions underpin the analysis undertaken in the GIG report and modelling. The
key assumptions underpinning the cost and benefits estimates are identified below.

Cost assumptions
The cost assumptions are based on the following:

- The cost assumptions underpinning the estimate of re-sleepering costs are discussed in
detail in SAHA’s report at Appendix K.

- The GIG report excluded other incremental capital and operating expenditure for the below
rail operator from its cost analysis. The impact of including these additional costs is
considered in section 5.2 and discussed in detail in Appendix F.

Benefit assumptions
The avoided road costs are based on the following assumptions:

- all avoided road investment costs would otherwise be occurred in the first year. This
assumption would appear to be simplistic. In practice, the costs would not be incurred at

51 ibid Sd+D report page 99
52 GIG report page 2

© 2009 KPMG, an Australian partnership and a member firm of the KPMG network of independent
member firms affiliated with KPMG International, a Swiss cooperative. All rights reserved.
The KPMG logo and name are trademarks of KPMG.
Liability limited by a scheme approved under Professional Standards Legislation.
least until the relevant rail line was closed. Section 5.2 and Appendix F examines this issue in more detail;

- the relevant roads would not be upgraded at all in the absence of the additional grain freight. Moreover, all road investment costs that otherwise would be incurred are caused by grain. In practice, it is more likely that the grain freight task would add to the freight task already occurring on these roads (e.g. there are currently high volumes of other traffic, and grain may be a small percentage of the total traffic). In addition, the GIG analysis assumes all road movements have an empty return journey. For these reasons separating out the additional damage caused by grain freight is likely to be difficult;

- the road upgrade costs in the GIG report do not take into account the lower maintenance costs following the upgrade (see discussion on road maintenance in Appendix F); and

- all avoided road investment costs would in fact be avoided. This assumption would appear to assume that rail maintains its market share (there is no leakage). In our view this is a critical assumption which, as highlighted in section 5.3, is unlikely to be valid. It also assumes the road upgrades would not happen anyway (e.g. due to changing community expectations regarding road safety).

Similarly to the cost calculations, other avoidable capital and operating expenditure for below road infrastructure were excluded from the analysis.

While the GIG report refers to avoided external costs from other reports, the avoided external costs reported in Appendix 9 of the GIG report indicate very little difference in external costs.

D.4 Line by Line assessment

A cost benefit assessment for each line using only the rail re-sleepering costs and the avoided road costs has also been undertaken. It therefore ignores the CBH costs.

It indicates that, using the GIG data and assumptions, the costs of re-sleepering several lines are lower than the road costs that would be incurred, if the rail lines were to be closed (i.e. on this basis some have a positive benefit cost ratio).

These results should, however, be interpreted with considerable caution because this comparison relies on all the key assumptions underpinning the GIG analysis (discussed in Appendix D.3) being valid. For example rail maintains its market share. Indeed, it implies some lines should remain open that the parties are themselves now suggest would be closed (e.g. Tambellup to Gnowangerup), as they are no longer being used.
E  GIG cost benefit analysis using updated data

This section presents the results of the GIG investment proposal using updated stakeholder data, but otherwise maintaining the same assumptions as used by the GIG. WestNet Rail was the only stakeholder able to provide updated data relevant to our analysis. As a result, the original CBH investment strategy has been used however, in reality this is likely to have changed somewhat given the passage of time and since the implementation of Grain Express. CBH did not provide the data during the timeframe of the review.

Table E-1 demonstrates the change in the total costs and benefits with WestNet Rail’s revised estimates for its re-sleepering program.

Since the GIG Report, WestNet Rail’s re-sleepering investment plans have changed somewhat in part to reflect recognition that some branch lines are unlikely to be economic even with re-sleepering. While the aggregate investment requirement has not changed significantly, increased unit costs means fewer kilometres are proposed to be re-sleepered.

<table>
<thead>
<tr>
<th></th>
<th>All lines open v. All lines closed</th>
<th>GNR1000 open v. GNR1000 closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs</td>
<td>$390,801</td>
<td>$214,084</td>
</tr>
<tr>
<td>Total benefits</td>
<td>$145,573</td>
<td>$139,913</td>
</tr>
<tr>
<td>Benefit cost ratio</td>
<td>0.37</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Table E-1 shows the updated re-sleepering costs do not change the results described above significantly. However, it is questionable how much can be drawn from this analysis unless all the relevant costs are updated. Appendix F addresses this issue.

E.1  Line by Line assessment

A cost benefit assessment for each line using only the updated rail re-sleepering costs and the avoided road costs indicates that following the restructure of WestNet Rail’s re-sleepering investment only two of the rail lines have benefits that outweigh their costs (although this does not incorporate any possible changes to the avoided road costs). The same caveats attached to the results in Appendix D apply here. Based on the updated data provided by WestNet Rail, they do not propose to invest in the Katanning to Nyabing, Tambellup to Gnowangerup and Narrogin-Yearlering rail lines. As a result, the costs and benefits associated with investing in these lines were not considered.53

53 The WestNet Rail data was provided at a more dissected level of rail line thus several of WestNet Rail’s updated numbers were added together to obtain the higher level rail line. These included: Maya-Perenjori in the WestNet Rail updates is included in the Maya to Narngalu line sum, Bruce Rock – Merredin in the WestNet Rail updates is included in the Bullaring to Merredin line sum, Narrogin-Yillimining in the WNR updates is included in the Bullaring to Merredin line sum.
GIG cost and benefit analysis including all costs and benefits

This section relies on the GIG data (updated in the case of WestNet Rail) and assumptions, but includes other categories of costs and benefits that we believe should reasonably be included in a proper assessment of the costs and benefits of the investment package.

Table F-1 presents the results of the cost benefit analysis using a more rigorous approach by including other avoidable capital and operating expenses. This data relates to:

- avoidable capital and operating expenses for WestNet Rail in the event of closing all the grain rail lines; and

- nets out the lower road maintenance costs that would not be incurred if the road investment is made.\(^{54}\) This is calculated by subtracting the annual road maintenance costs across the whole network if the roads are not upgraded (i.e. rail lines open), from the annual road maintenance costs if the roads are upgraded (i.e. rail lines closed).

<table>
<thead>
<tr>
<th>Table F-1: Results identifying all costs and benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>All lines open v. All lines closed</td>
</tr>
<tr>
<td>Total costs</td>
</tr>
<tr>
<td>Total benefits</td>
</tr>
<tr>
<td>Benefit cost ratio</td>
</tr>
</tbody>
</table>

Table F-1 indicates that, on the basis of the GIG data and assumptions, but including updated cost data where available and all relevant costs and benefits, significantly worsens the benefit cost ratio in both scenarios.

Similar to the previous scenarios these results are subject to the data being used and the assumptions underpinning the evaluation.

The above evidence suggests, the benefits of keeping the rail lines open do not outweigh the costs when a more rigorous approach to comparing the avoidable costs from investing in the rail network rather than roads is used. Indeed, the business case for the investment becomes less favourable.

\(^{54}\) Lowes Churchill Associates (2006) acknowledged that in situations where a road is to be upgraded to accommodate the increased traffic maintenance costs could be lower, for example increasing the number of lanes would reduce shoulder and edge wear however this may be offset by resealing. The maintenance costs discussed above were taken from the GIG modelling.
F.1 Costs

Other “stay in business” investment

This cost is the average capital expenditure directly attributable to branchlines over the last five years. WestNet Rail identified this as incremental capital costs as there would be no expenditure if the lines were closed.\(^{55}\)

Other “stay in business” opex

This cost is attributable to the grain branchlines and comprises:

- perway expenses;
- incident costs; and
- control and communication costs.

The avoidable overhead costs were excluded from the calculation as these would likely be offset by an increase in overheads for the Department of Main Roads if the rail lines were closed.

Road maintenance

Following an upgrade in roads, maintenance costs decline each year over the investment period.\(^{56}\) In effect, this reduces the net cost of having to invest more in roads if the rail lines are closed.

F.2 Benefits

Road maintenance

The lower road maintenance costs actually serve to reduce the net cost of having to upgrade the roads, if rail lines are closed. This is because the investment in road reduces the maintenance costs that would otherwise be incurred. This means that the reported benefits of investing in the rail network (i.e. the avoided costs of investing in the road network), are somewhat lower than the required capital expenditure over the life cycle of the investment.

\(^{55}\) The asset lives of the various investments in re-sleepering, rapid rail loading and road may differ (although we only have a figure for the re-sleepering assets of 10 to 15 years). Where annual operating cost savings are taken into account, we have assumed an asset life consistent with the life of the primary investment in re-sleepering. The GIG model indicates the life of the road upgrades is in line with the life of the re-sleepering investment therefore the CBH investment is the only cost likely to have a residual value. Assuming an asset life of 20 to 30 years for these assets does not substantially affect the outcome.

\(^{56}\) The fall in maintenance costs due to upgrades only applies to the 11 rail lines assessed for upgrade. Thus, if all rail lines were closed the fall in road maintenance costs may in fact be higher. For the purpose of our assessment, the maintenance costs are assumed to be lower over the course of the investment.
Road operating expenditure

Road operating costs were not included in the assessment as the operating costs of the Department of Main Roads are unlikely to change as a result of the road investment program. In effect, some increase in overheads has been allowed for by reducing the stay in business costs of WestNet Rail (i.e. the overhead costs).

External costs

External costs have also been excluded from the analysis due to the apparent lack of any change as indicated in the GIG modelling results. External costs are covered in greater detail in the SAHA report (Appendix K) and an example of their impact using the Sd+D estimates is provided in Appendix F.4.

F.3 Using alternative discount rates

In the analysis in section 5, a discount rate of 4 per cent is used for consistency with the GIG analysis. In practice, however, there are a variety of precedents for using a higher discount rate. For example:

- Infrastructure Australia recommends using a 4 per cent, 7 per cent and 10 per cent discount rate and notes that these rates are in accordance with national, state and territory guidelines on cost benefit analysis.

- Under the Commonwealth Government’s Nation Building Program, projects requesting funding were required to use a 7 per cent discount rate with a 4 per cent sensitivity test.\(^57\)

- In practice, recent evidence indicates a discount rate of 7 per cent has been used for road investments. For example, a 7 per cent discount rate was used to calculate the benefits to the heavy vehicle industry of the Deer Park Bypass in Victoria.\(^58\)

On this basis, we conclude that the analysis should use a 7 per cent discount rate with sensitivities at 4 per cent and 10 per cent.

Appendix J-1 has a broader discussion on discount rates.

The net effect of using a higher discount rate is as follows.

Table F-3 shows the difference in the cost-benefit analysis under alternative assumptions for the discount rate for the all lines closed scenario. It shows that using higher discount rates slightly increases the cost benefit ratio though the difference is very marginal. The GIG report assumed all the avoided road costs were undertaken in the first year, however as discussed above, this is unlikely to be the case. Therefore, to generate the cost benefit ratio, the investment in road upgrades were pro-rated according to the proposed re-sleepering cost for

\(^{57}\) This was required under the original Auslink program
each rail line and delayed by one year (assuming the road upgrades would be required one year following the closure of the rail line).

Table F-3: Discount rate sensitivity analysis

<table>
<thead>
<tr>
<th></th>
<th>4% discount rate</th>
<th>7% discount rate</th>
<th>10% discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs ($m)</td>
<td>$744,094</td>
<td>$639,979</td>
<td>$559,200</td>
</tr>
<tr>
<td>Benefits ($m)</td>
<td>$179,301</td>
<td>$156,708</td>
<td>$138,362</td>
</tr>
<tr>
<td>Benefit-Cost ratio</td>
<td>0.241</td>
<td>0.245</td>
<td>0.247</td>
</tr>
</tbody>
</table>

The results do not change significantly because the costs and benefits are assumed to have equal timing. In practice, this is likely to be a conservative assumption (i.e. it would normally be reasonable to assume the benefits occur later than the costs).

F.4 Including externality costs

The analysis above excluded avoided external costs from calculating the benefits due to the uncertainty regarding the appropriate estimate. For illustrative purposes Table F-4 shows the results of the benefit cost analysis updated to include the Sd+D estimate of $5.3m per annum in external costs under the all lines closed scenario.59

Table F-4: Results identifying all costs and benefits

<table>
<thead>
<tr>
<th></th>
<th>All lines open v. All lines closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs</td>
<td>$751,438</td>
</tr>
<tr>
<td>Total benefits</td>
<td>$254,249</td>
</tr>
<tr>
<td>Benefit cost ratio</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Table F-4 shows that including the $5.3m per annum in avoided external costs under the all lines closed scenario does not significantly change the fundamental result, despite increasing the cost benefit ratio.

SAHA were unable to obtain the sources of the externality unit costs used in the WASGIS report so consulted a number of other published sources and found:

- the unit costs used by Sd+D were understated by 38% for road and 116% for rail; and
- taking into account the WASGIS report’s assumption that when rail is closed, the road distance is approximately 15% less than rail, SAHA found the estimated externality cost of $5.3m per annum resulting from total loss of rail service was understated by 3%.

For details of this calculation see SAHA report (Appendix K).

59 Sd+D calculated the $5.3m externality costs per annum based on unit cost for road and rail sourced from the Bureau of Transport and Regional Economics Report (2000) and internal DPI advice.
F.5 Testing of outcomes under likely energy price scenarios

SAHA tested the sensitivity of above road and above rail operating costs to several factors including fuel price. The impact of changes in the fuel prices on road and rail costs per tonne were assessed for three sample sites (Kalannie, Brookton and Newdegate). SAHA used $0.80c/l as the base assumption for the fuel price and $1.00/l as the upper scenario and $0.60c/l as the lower scenario.

Table F-5 illustrates the range of percentage change in the costs per tonne for each form of grain transportation (see section 4.10 in SAHA report, Appendix K for more details).

Table F-5: Range of percentage change in road and rail costs per tonne

<table>
<thead>
<tr>
<th>Fuel price scenario</th>
<th>Road</th>
<th>Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.00/l</td>
<td>5% to 6%</td>
<td>1% to 2%</td>
</tr>
<tr>
<td>$0.60c/l</td>
<td>-5% to -6%</td>
<td>-1% to -2%</td>
</tr>
</tbody>
</table>

Sensitivity testing indicated fuel prices have a greater effect on road costs per tonne than rail which SAHA attributes to rail’s greater fuel efficiency over large distances.
Testing the GIG cost estimates and assumptions

This section discusses the costs and benefits of the GIG proposal having tested the cost estimates and assumptions as outlined in section 5.2 (for greater detail see SAHA report in Appendix K);

This section provides the results of the cost benefit analysis using SAHA’s cost estimates. These costs were estimated by reviewing and testing the technical and cost assumptions used in the GIG Report.

Table G-1: Results using SAHA cost estimates

<table>
<thead>
<tr>
<th></th>
<th>All lines open v. All lines closed</th>
<th>GNR1000 open v. GNR1000 closed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total costs</strong></td>
<td>$750,556</td>
<td>$419,790</td>
</tr>
<tr>
<td><strong>Total benefits</strong></td>
<td>N/A</td>
<td>$250,536</td>
</tr>
<tr>
<td><strong>Benefit cost ratio</strong></td>
<td>N/A</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Due to lack of sufficient detail available to build alternative estimates, SAHA were unable to estimate:

- road upgrade costs incurred if all grain rail lines were closed; and
- road maintenance and operating expenditure costs associated with both scenarios.

Notwithstanding this, Table G-1 shows the costs of keeping all rail lines open are close to those estimated in Appendix F.

The results for the GNR1000 lines indicate the costs of investing in these rail lines outweigh the benefits.

For a detailed discussion of the assumptions underpinning the cost and benefit estimates please see the attached SAHA report in Appendix K.

G.1 Costs

Re-sleepering investment

These costs were estimated based on WestNet Rail’s capital expenditure plan by kilometre and reflect higher unit costs. The total re-sleepering costs also include the wages and salaries associated with the re-sleepering projects.
Other “stay in business” investment

The “other stay in business” investment is the same as in Appendix F and based on information from WestNet Rail.

Other “stay in business” opex

The “other stay in business” operating expenditure is the same as in Appendix F and based on information from WestNet Rail.

Storage and handling

SAHA estimated these costs using the original CBH input data. SAHA’s estimates are slightly higher than those presented in the GIG Report.

Road upgrades

SAHA’s estimates of the road costs for keeping all lines open were greater than the GIG report estimates and are based on budgeted and actual costs incurred by Main Roads WA during 2007-08 for maintaining and improving the state’s road network. As per the previous cases, the road upgrades are associated with GNR1000 lines only and therefore the road upgrade costs are the same for the “All lines open” and GNR1000 lines open scenarios.

G.2 Benefits

Avoided road costs

As discussed above, SAHA were unable to estimate the road costs for closing all rail lines due to insufficient data. The road costs for closing the GNR1000 lines were higher than the GIG Report. These estimates were based on a sensitivity analysis around budgeted and actual costs incurred by Main Roads WA during 2007-08 for maintaining and improving the state’s road network.
H The principles of bypass

This section provides a simplified discussion on the principles of bypass.

Bypass occurs where a customer is able to get a similar service more cheaply than the incumbent is prepared or able to offer the service. Bypass is driven by the relationship between:

- the price that the incumbent is offering to provide the relevant service; and
- the cost to the customer of using another service provider (or the cost of self-supply), to provide the same service. The risks of bypass (both positive and negative) are also likely to be relevant considerations in this regard. The cost to the customer is often referred to in the context of bypass as their ‘stand alone’ cost.

Figure H-1 below provides a simplified example of this.

Figure H-1: Bypass

Bypass can either be ‘efficient’ (from society’s perspective) or ‘inefficient’. The efficiency of bypass is driven by the relationship between a service provider’s price and its incremental cost, and the customer’s stand alone cost. The relationship between a service provider’s price and its incremental cost can be particularly important in network industries (like rail), which are capital intensive and have large sunk costs (although the incremental costs of network industries can also be high when parts of the capital stock need to be replaced or added to).

Efficient bypass occurs when a person seeking access decides to serve themselves because their stand-alone costs are below the service provider’s price and incremental costs. Figure H-2 below illustrates this situation.
By contrast, inefficient bypass occurs when a person seeking access decides to serve themselves even though their stand-alone costs are higher than the service provider’s incremental costs. This can occur when the service provider’s price is above its incremental cost (i.e. includes the recovery of fixed or sunk costs). Figure H-3 below illustrates this situation.

The risk that bypass is inefficient is highest where there is a significant gap between the service provider’s total costs and prices, and its incremental costs. This problem is common in network industries as the service provider wants (and needs) to recover its total costs. Regulation typically allows this to occur by reallocating sunk costs onto customers who have less scope to bypass. Ultimately, however, regulation cannot protect the prices for using an asset, that seek to recover sunk costs, if significant parts of the market do not want to pay for the use of them. In these circumstances, the service provider would typically price down to incremental cost to ensure continued use of the asset, but bear the loss in asset value this implies.
Bypass of the rail supply chain may occur (either partially or completely) where a grain grower is able to transport grain at a lower cost than the rate offered by CBH. CBH’s grain freight rates include charges for the utilisation of the WestNet Rail and ARG components of the grain freight supply chain. It is worth noting that, like many network industries, the rail supply chain contains a significant proportion of fixed costs. This means that the difference between a service provider’s incremental costs and its total costs is typically large. To the extent that the rail supply chain is able to enforce to some degree the recovery of these sunk costs (even where it is uneconomic to do so and would not be possible in a deregulated market), the risk of inefficient bypass is higher.
I Cooperative Bulk Handling

This section discusses CBH’s corporate structure and its pricing strategy based on information in the public domain. This is relevant to the risk of bypass, the market share assumption and concerns expressed by a wide variety of stakeholders regarding its behaviour.

CBH is an integrated business that stores, handles and markets grain. Figure I-1 summaries the group structure, which comprises:

- *Grain Operations* – bulk grain storage and handling across 197 sites and four port facilities.
- *Grain Pool Pty Ltd* – international grain marketing company exports barley, lupins, oats, wheat and canola from WA, along with accumulating and marketing around 3 – 4 million tonnes per year.
- *AgraCorp Pty Ltd* – wholly owned subsidiary of Grain Pool which trades grain worldwide.
- *Bulkwest Engineering Pty Ltd* – wholly owned subsidiary of CBH offering engineering and construction services for CBH and other parties.

Figure I-1: CBH Group structure


CBH are also involved in a number of other ventures including60:

- Pacific Agrifoods Investments Pty Ltd (Investment) – 50% ownership;

---

60 CBH 2008 Annual Report, Note 27 to Financial Statements, p93.
• Bulkeast Engineering Pty Ltd (Engineering construction) – 50% ownership;
• Grain Direct Pty Ltd (Dormant) – 50% ownership;
• Australasian Lupin Processing Pty Ltd (Lupins dehulling and processing) – 50% ownership;
• United Bulk Carriers Pty Ltd (Chartering) – 50% ownership;
• Pacific Agrifoods Limited (Investment) – 50% ownership;
• PT Eastern Pearl Flour Mills (Flour milling) – 50% ownership; and
• Wheat Australia Pty Ltd (Wheat exporting) – 33% ownership.

CBH’s Board and management team undertook a strategic planning process in 2008 to clarify their future direction, purpose and vision. CBH has defined their purpose as:

To link our growers to our customers in a uniquely valuable way by achieving scale, supply chain efficiency and securing demand.

The vision for CBH is to be:

The stand out choice in grain for the world.

CBH has a cooperative ownership structure which is controlled by around 4,800 grower members across WA. Membership has declined from over 7,500 grower members in 2002, which is likely to reflect consolidation in the WA grain industry.

CBH’s commitment to their members is reflected in the composition of its Board of Directors, which comprises 12 elected members including:

• two Directors from each of the four districts (Albany, Esperance, Geraldton, Kwinana) with one additional Director from Kwinana in recognition of it being the largest district in terms of shareholders, production and geographic area; and
• up to three other Directors with specialist skills as considered appropriate by the Directors.

Cooperatives typically operate to provide services to its members with limited return of capital. This is consistent with the operations of CBH and its governing documents (the Bulk Handling Act 1967 and the company’s Articles of Association), which prohibit the distribution of any surplus or profits to shareholders. Retained earnings provide a source of capital for CBH Group to reinvest in assets for the benefit of grower members.

---

61 CBH Group, Annual Report 2008, p.6  
62 Ibid, p.2  
63 CBH Group, Annual Report 2002, p.2  
file 1.doc
Table I-1 outlines CBH’s key results from 2008. Total revenues of $1.108 billion for 2008 were generated predominantly from grain trading and marketing services (76 per cent) and grain handling services (16 per cent). In terms of 2008 profitability, grain trading and marketing services generated the highest profit (69 per cent), whereas the contribution by grain handling services to total profit was much smaller (3 per cent).64

<table>
<thead>
<tr>
<th>CBH Group</th>
<th>Financial year end 31 October 2008</th>
<th>Average 2005 - 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenues</td>
<td>$1,108,388,000</td>
<td></td>
</tr>
<tr>
<td>Profit attributable to members of parent entity</td>
<td>$40,143,000</td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,698,683,000</td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td>$976,651,000</td>
<td></td>
</tr>
<tr>
<td>Return on Assets</td>
<td>2.4%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>4.1%</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

Source: CBH Group Annual Report 2008

In terms of capital expenditure, CBH would appear to have invested about $750m between 1996 and 200865, although that annual capital expenditure has varied considerably over this period (see Figure I-2 below). This expenditure has included the 1999-2005 capital works program for additional storage capacity and improved grain handling operations (completed we understand in 2009 with the commissioning of new rapid loading facilities at York) and peaked in 2006 with the completion of the $130m upgrade to the Albany Port.

Figure I-2: CBH capital expenditure 1997-2007

64 Flour milling (27 per cent) and Engineering and other services (10 per cent) had higher contributions to total profits in 2008.
65 Estimate based on expenditure detailed in Figure I-2 and data from 2008 Annual Report.
Comparing the level of capital expenditure over the last 13 years and CBH’s total assets implies a high level of asset replacement.

**CBH’s financial performance**

CBH’s return on assets would appear to be well below commercial expectations, particularly given its functions (e.g. trading) and the risks associated with them. For example, the yield on the March 2019 Government Bond (i.e. the reference 10-year risk free rate) is currently around 4.8 per cent (pre-tax). The discount rate used in the GIG analysis is 7 per cent (real, pre-tax return on assets).

Growers’ equity in CBH is around $203,000 per grower member or around $144,000 per share.

Given the above, it would appear that CBH:

- can deliver benefits to growers either through:
  - the prices it charges for services (although this is likely to impact on returns); and / or
  - the quality of those services and the efficiency with which they are provided (e.g. by maximising the use of its assets);
- can deliver equity between growers through how it prices and allocates its services to members.

There would appear to be evidence to suggest that CBH achieves equity through its pricing decisions, as illustrated by its grain receival, storage and handling charges for Grain Operations in 2008/09.

Each of CBH’s 197 receival sites are grouped as either a Tier 1 or Tier 2 location, with Tier 2 locations charged a higher fee for receival of grain. Charges for grain storage and handling do not vary by location. The lack of price differentiation across the CBH network implies that the charges are not particularly cost reflective between locations, given the differences in volume received (and therefore ability to recover costs).

This pricing approach would appear to highlight the importance of having demonstrably ‘equitable’ charges.

We understand that growers are charged differential freight rates under Grain Express based on receival site and destination location. The extent to which these freight charges are cost-

---

66 CBH Group Annual Report 2008 quotes membership of around 4,800 growers and 6,783 ordinary shares at 31 October 2008.
68 Freight rates include “estimated rail charges, (partially hedged) fuel risk for 12 months, contestable premiums, essential harvest moves and audit fees”.

file 1.doc
reflective is unclear, but it appears that charges for locations closer to the ports are disproportionately higher than those locations further away based on the distance travelled (refer Table I-2).

Table I-2: Comparison of Grain Express Freight Rates 2008-09

<table>
<thead>
<tr>
<th>Route</th>
<th>Distance travelled (km)</th>
<th>Discounted grower freight rate ($ per tonne excl GST)</th>
<th>Implied freight rate per km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avon – MGC</td>
<td>107</td>
<td>11.8096</td>
<td>0.1104</td>
</tr>
<tr>
<td>Brookton – MGC</td>
<td>213</td>
<td>13.0544</td>
<td>0.0613</td>
</tr>
<tr>
<td>Narrogin - MGC</td>
<td>283</td>
<td>18.9758</td>
<td>0.0671</td>
</tr>
</tbody>
</table>

This pricing approach would appear to be consistent with recovering costs on those parts of the network which are hardest to bypass (e.g. the infrastructure closest to the ports); in other words, consistent with limiting the risk of bypass. This reduces the capacity of traders and growers to bypass the system relative to more cost reflective charges (which may render parts of the system redundant), but is unlikely to remove it. It is more likely to shift where bypass occurs.
J Additional information

J.1 Alternative discount rates

The GIG analysis uses two discount rates:

- A social discount rate of 4 per cent (real, pre-tax) for assessing the merits of the proposed investment (i.e. 4 per cent was used to discount the cash flows for the proposed investment costs and benefits);

- A target rate of return of 7.02 per cent (real pre-tax) for the whole supply chain. While individual stakeholder’s return on capital targets varied, the GIG report applied an average of 7.02 per cent over the whole supply chain.69

The social discount rate

The basis of selecting a 4 per cent discount rate is not clearly stipulated in the GIG report, and no sensitivity test was conducted by varying the discount. The evidence would appear to suggest that a 7 per cent discount rate should be used as a mid-point, with sensitivities done on 4 per cent and 10 per cent.

In the Department of Finance and Administration’s Introduction to Cost-Benefit Analysis (CBA) published in 2006 they note that:

“….. the level of the discount rate should reflect the type of project being evaluated. Hence, where a proposal represents a social or health programme that could only be provided by government, the choice of discount rate would take into account the fact that a commercial return is not the objective. Regardless of the basis for the selection of discount rate, CBA reports should explain how and why the discount rate was selected”70.

A report by the Bureau of Transport Economics (BTE) noted there are two approaches to selecting a discount rate. One is to use a risk-free rate (such as the 10-year Commonwealth bond rate) and the other is to include a market risk premium.71 The BTE concluded the risk-free rate was appropriate where a fixed transport program budget was being allocated amongst projects. In contrast, if the decision was whether to increase a program budget through the adoption of another project, then a risk premium should be included. Thus according to this framework, it would appear the GIG evaluation should include a risk component in the discount rates for road and rail.

69 While the report noted the model was able to assess the impact on the return on capital to infrastructure providers under alternative assumptions regarding market share, market price and capital subsidisation variables, no such results were discussed or presented in the report. See Grain Infrastructure Group, Western Australia’s Grain Freight Network Review, March 2008, page 21.


According to Infrastructure Australia’s Prioritisation Methodology, a real discount rate of 4 per cent, 7 per cent and 10 per cent should be used to discount the cash flows of infrastructure projects requesting funding. Infrastructure Australia further notes that these rates are in accordance with national, state and territory guidelines on CBA.

Further, under the Commonwealth Government’s Nation Building Program, projects requesting funding were required to submit a Project Proposal Report (PPR) demonstrating the costs and benefits of the project using a 7 per cent discount rate with 4 per cent sensitivity test unless otherwise stated. The second phase of the Nation Building program does not appear to provide any update on this requirement.

Competitive neutrality is also likely to be a key consideration when comparing the costs and benefits of investing in road and rail infrastructure projects. Competitive neutrality requires that government owned businesses do not have net competitive advantages over their private sector competitors simply as a result of their public ownership. Given road infrastructure is government owned and competing with the privately owned rail network, it is important that government owned roads earn sufficient revenue to cover their costs including the cost of capital. The Commonwealth Competitive Neutrality Complaints Office (CCNCO) notes,

“Unless government businesses are required to earn a commercial rate of return, they could continue to operate with lower profit levels than rival firms. In turn, this could allow them to undercut their competitors through lower prices, even though they were no more efficient.”

According to the CCNCO, the level of market risk for infrastructure and utilities is a beta of 0.6 and an associated nominal pre-tax WACC of 8.4 per cent.

This issue was raised in the WA Government’s submission to the 2007 Productivity Commission’s Inquiry into road and rail freight infrastructure pricing. The WA Government considered that while rail investments used a commercial rate of return, road investments were assessed using a social discount rate. In addition, assessment of rail projects do not include the broader social benefits that are included in road investment evaluations.

Given the road and rail networks are competitors in the freight market, according to the CCNCO, to ensure competitive neutrality government owned businesses (roads) should include a commercial rate of return on their investment.

In practice the evidence indicates a discount rate of around 7 per cent has been used for road investments while there is greater variability in the rates applied to rail investments:

- The 2007 Heavy Vehicle Charges Determination Regulatory Impact Statement provided a case study of the Deer Park Bypass in Victoria whereby the benefits to the heavy vehicle industry were calculated using a 30 year time frame and a 7 per cent discount rate.

---

73 Government of Western Australia, Submission to the Productivity Commission Inquiry into Road and Rail Freight Infrastructure Pricing, 2006.
74 This does not necessarily imply the same discount rate should be used for rail and road investments as they may have different risk profiles and thus require different discount rates.
The Allen Consulting Group report for the AAA noted that in calculating the road user benefit cost ratio for the Western Sydney Orbital, the RTA (and NSW Treasury) recommended discount rate of 7 per cent was used.\(^7^6\)

The Department of Finance and Administration provided several case studies one of which was the cost-benefit analysis of the Brisbane-Melbourne rail link. The analysis was conducted with both a 4 per cent and 7 per cent discount rate however the BTRE determined that a 4 per cent discount rate was appropriate and reflected the 10-year Treasury bond rate (in real terms) at the time of the analysis.\(^7^7\)

The Department of Finance recommended a discount rate of 8 per cent comprising a 5 per cent risk-free component and 3 per cent risk premium (compared to a 5-6 per cent risk premium for non-government businesses) for general government investments.\(^7^8\) However the BTE noted several 1990s evaluations of rail used an even higher rate.

**The target rate of return**

As indicated above, the GIG analysis uses an average target rate of return of 7.02% when estimating the revenues approximated by the businesses in the freight supply chain to remain commercially viable. The basis for this assumption is not described in particular detail in the GIG report.

The GIG report assumes the industry will provide the necessary contributions following the proposed government funding.

> “The industry contribution through the CBH investment, any contribution from WestNet rail, and Main Roads WA, could subsequently evolve into a contribution that would effectively fund future capital requirements beyond the initial ten year period, removing the need for consideration of future government funding”.\(^7^9\)

The assumptions about the businesses’ cost of capital may be important for how businesses respond to any investment by the Government (i.e. whether they also invest), particularly in light of the recent developments in the financial markets and the broader economy.

We note that the average target rate of return is lower than the Economic Regulation Authority’s (“ERA”) most recent determination for WestNet Rail’s rail freight network. The ERA determined a real pre-tax WACC of 9.77 per cent for the period 1 July 2008 to 30 June 2009.\(^8^0\) A determination on the WACC for the period 2009-2010 will be made in June 2009.

---

\(^7^5\) National Transport Commission, 2007 Heavy Vehicle Charges Determination Regulatory Impact Statement, December 2007
\(^7^7\) Ibid., Department of Finance and Administration, January 2006.
\(^7^8\) Ibid., BTE, 1999
\(^7^9\) GIG report, p.25
\(^8^0\) Economic Regulation Authority, 2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks, 23 June 2008.
If those returns are insufficient, parts of the rail supply chain may require higher prices to justify investing.

Further, the impact of the global financial crisis on the cost and availability of capital is critical for investment going forward and will likely affect businesses ability to finance new investment. The Boston Consulting Group notes that:

- Those companies that want to invest will find available credit scarce and more expensive as financial institutions become more selective in their lending decisions; and

- Most companies will face a significantly higher cost of capital as investors demand more hefty risk premiums across all asset classes. Even companies with good credit ratings will face higher borrowing costs due to widening spreads. Importantly, BCG note that “under any scenario, we will not return to the overly cheap debt pricing that prevailed pre-crisis...”. 81

The impact of these changes is likely to be felt significantly by infrastructure providers. Investors and lenders are now more cautious in their approach in dealing with infrastructure projects, in particular those supported by property/infrastructure trust structures with relatively high levels of leverage or complexity. Additionally, the markets are now capital constrained and with infrastructure projects requiring capital to potentially be tied-up for up to 10 years; this ultimately works against the preference of lenders to recycle capital over a shorter period. Given the high degree of volatility and uncertainty that exists in the capital markets, successful transactions will now need to address a range of stakeholder concerns and the general lack of confidence that now exists in the market.

J.2 Electricity industry case study

The Australian electricity market has undergone extensive structural change and deregulation which has impacted the way in which the price of electricity is determined. The changes which have occurred as a result provide important lessons for the grain freight industry. In particular, the electricity market has shifted from one that is highly regulated at each market segment to a privatised and largely deregulated commodity market. This evolution has produced many benefits and challenges. This section outlines those changes.

Appendix J.2.1 describes the electricity market before deregulation, including how prices were set and what that meant for price risk. Appendix J.2.2 outlines the changes that deregulation has brought including how prices are set and how price risk is taken into account. Finally, appendix J.2.3 discusses the parallel implications for the grain freight industry.

J.2.1 Pre-deregulation

Prior to deregulation, electricity was supplied to customers through vertically integrated monopolies. This was seen as the most efficient way to supply electricity given the large fixed

81 Rhodes, D., Stelter, D., Saumya, S., and Andre Kronimus, Boston Consulting Group, Collateral Damage: What the Crisis in the Credit Markets Means for Everyone Else, October 2008
costs of the industry. These monopoly companies managed all four levels of energy production to sale including:

- the generation of electricity from various power sources;
- the transmission of this electricity on high voltage lines to cities and towns;
- the distribution of this electricity via low voltage lines to households and businesses; and
- the retail sale of this electricity to final consumers.

Figure K-1: Electricity industry value chain

Each segment of this supply chain incurred different costs that were ultimately passed onto the final consumer. Given that these companies were monopolies, regulators would regulate the amount of revenue they expected to receive each year or the price they charged to ensure that final consumers were not being charged excessively high prices.

Typically, this regulation involved the setting of an average price for electricity that was charged to consumers anytime throughout the day. This price was based on the average cost of supplying electricity throughout the day, despite the fact that the cost to supply electricity at different times of the day can vary substantially. For example, the Energy Reform Implementation Group has noted that:

“the spot price is particularly volatile and can vary from negative $1,000 per megawatt hour (MWh) to $10,000 per MWh.”\(^2\)

This is because in peak demand times, power companies need to utilise more marginal sources of energy to supply consumers which costs much more than average costs. As such, during such times of the day or year, power companies would be exposed to high costs and average prices, leading to economic losses. Conversely, during low peak times, the cost to supply electricity would be much lower than the average price, thus power companies would be obtaining high returns.

\(^2\) Energy Reform Implementation Group, Energy Reform – The way forward for Australia, Supporting appendices, January 2007, p.17
As a result of electricity being priced in a non-cost reflective manner:

- the risks associated with electricity price volatility were not transparent to consumers. As such, consumers were not able to manage their demand to respond to electricity prices;
- in addition, given that consumers faced an average price, there was a significant level of cross-subsidy between peak and off-peak users of electricity; and
- cross-subsidies also existed between the segments of the vertically integrated electricity supply chain which were not transparent to consumers.

As discussed in the following section, an important consequence of deregulation was the exposure of electricity price risk and the unwinding of cross-subsidies.

### J.2.2 Deregulation of the electricity market

After slow development of the market over many years, it was observed that greater efficiencies could be realised if the electricity market was disaggregated into its four components. This move recognised that the generation and retail segments of the industry were competitive and the transmission and distribution segments were more in the nature of natural monopolies. Hence the generation and retail segments of the market was deregulated and opened up to competition (although the extent of this deregulation and privatisation varies by State and by the size of customer).

**Figure J-2: Electricity industry structure following deregulation**

As a result of this separation, generators now compete with one another to sell electricity to retailers and large customers, either on a contracted or uncontracted basis. In doing so, they have the incentive to price electricity in a way that allows them to manage the risks associated with fluctuating prices and recover the high levels of fixed costs that are involved in electricity generation activity. Furthermore, retailers compete with one another to sell electricity to final consumers. The role of the retailer is to package purchased electricity with electricity transportation costs for on-sale to consumers, frequently at fixed prices. Whilst electricity
transportation costs are subject to price regulation, retailers (like their generator counterparts) face price risk in purchasing electricity for supply to their customers. If this risk is not managed, it can potentially erode the margin that a retailer earns. It is therefore in the interests of both generators and retailers to effectively manage price risk.

Contracting for the sale and purchase of electricity outside of the wholesale spot market is one method of mitigating price risk. Another method is by utilising insurance based instruments to minimise the remaining risk of under-recovery. Many retailers and generators enter into various forms of derivative instruments, such as futures contracts, which enable them to hedge against future price movements. This ensures that both retailers and generators are not exposed to adverse price fluctuations that severely impact their profitability. However, as with the nature of insurance, they can not take advantage of favourable generation prices. To obtain this certainty they pay a risk premium equivalent to their expected risk over a certain time horizon. Figure J-3 demonstrates this by showing that the futures price for electricity is generally higher than the spot price, where retailers are paying a premium for price certainty.

**Figure J-3: NSW futures and spot prices for electricity generation**

The extent to which retailers and generators may choose to insure against price risk depends on their appetite for risk. Some retailers and generators prefer to be fully hedged so that they are always fully covered for price fluctuations. However, other retailers and generators will take less than 100% insurance and trade the balance of their requirements on the spot market.

The importance of the requirement for generators and retailers to manage price volatility has led to some re-integration of the electricity market, in the form of generators forward integrating with retailers (and vice versa). This development is perceived by many market participants as being inevitable given the material benefits associated with risk management and a reduced cost of capital. This trend has occurred not only in Australia, particularly in
Victoria, but also in countries such as the US, UK and New Zealand. The Energy Reform Implementation Group notes that:

“Vertical integration between generation and retail businesses is a commercial response to the very high level of risk in the electricity market and the largely inverse risk between generators and retailers. The differences in risk provides a partial natural hedge that makes at least partial vertical integration attractive”\(^{83}\).

In addition, there has been significant consolidation amongst retailers. There are now three major privately owned retailers in the market and a number of more niche market retailers.

**J.2.3 Relevance to the Grain Freight Industry**

The way in which the electricity market in Australia has evolved since deregulation provides some indication on how the WA grain freight market may be expected to evolve going forward.

Where previously wheat farmers would sell their produce to the AWB at a set average price throughout the year, the disbandment of the AWB has meant that wheat farmers or marketers are now directly exposed to the prevailing world price on international wheat markets. The world price for grain is determined by international factors and Australian grain farmers are largely price takers in this market. This exposure to grain price volatility has implications for the timing of grain freight sales and, indirectly, the preferred mode of freight transportation.

In terms of flexibility and speed of transportation, road transport would appear to offer significant advantages over rail. This switching to road may assist to minimise the risk that farmers face in terms of fluctuating world prices impacting on their returns.

As has occurred in electricity, forward integration of grain farming operations with road transport operations has commenced and may become more prevalent. This arrangement could allow grain farmers to more effectively respond to the price risks that they face by moving their freight more quickly. There also may be considerable consolidation amongst marketers.

Some in the grain freight industry have expressed the view that this pattern of shifting to road transportation and vertical integration is simply a short-term issue, driven by the industry’s response to the recent deregulation of the market and the incidence of a “bumper crop” year which requires greater utilisation of road transportation.

Whilst it may be too early to tell what will eventuate for the grain freight industry, the experience in the electricity industry suggests that deregulation will result in a substantial structural shift in the market and industry.

\(^{83}\) Ibid, p8.
Technical, cost and market analysis – SAHA International
KPMG and Department of Infrastructure, Transport, Regional Development and Local Government

Independent Review of the Grain Infrastructure Group’s (GIG’s) Freight Network Review

Review of Technical, Cost and Market Assumptions

Final Report
Contact Person
Liesbet Spanjaard
Director
0413 457 067
lspanjaard@sahainternational.com
Sydney Office

John Crosbie
Associate Director
0418 177 291
jcrosbie@sahainternational.com
Melbourne Office

Melbourne
Level 26, 385 Bourke Street
Melbourne
VIC 3000
Australia
T  +61 3 9934 0600
F  +61 3 9602 4825

Sydney
Suite 1, Level 12, Tower 3
Darling Park
201 Sussex Street
Sydney
NSW 2000
Australia
T  +61 2 8299 4200
F  +61 2 9279 2066

Brisbane
Level 5, 500 Queen Street
Brisbane
QLD 4000
Australia
T  +61 7 3230 3333
F  +61 7 3230 3399

Wellington
Level 4, Clayton Ford House
128 – 132 The Terrace
PO Box 5350
Wellington
New Zealand
T  +64 4 499 7007
F  +64 4 499 7009

Johannesburg
Level 7, The Mall Office Tower
11 Cradock Avenue
Rosebank 2196
South Africa
T  +27 11 268 8800
F  +27 11 327 7344

Cape Town
Canal Walk West Office Tower
1st Floor Premises
Century Boulevard
Century City
Cape Town
South Africa
T  +27 21 526 2700
F  +27 21 552 0440
Disclaimer

Saha International Limited (SAHA) has prepared this report taking all reasonable care and diligence required. This report provides high-level analysis only and does not purport to be advice on particular investment options or strategies. In particular, the analysis and options included in this presentation are based on the information made available by the Grain Infrastructure Group and other stakeholders. Much of this information is confidential to the parties and cannot be disclosed.

While SAHA has used all reasonable endeavours to ensure the information in this report is as accurate as practicable, SAHA, its contributors, employees, and Directors shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on this document whatever the cause of such loss or damage.

This report is intended for the sole use of “KPMG”, and should not be circulated to third parties without the express permission of SAHA.
# Table of Contents

Glossary .............................................................................................................................................................6  

1 Executive Summary ...................................................................................................................................7  

2 Introduction...............................................................................................................................................15  

2.1 Approach .............................................................................................................................................15  

2.2 Market Assumptions ............................................................................................................................15  

2.3 Technical and Cost Assumptions ........................................................................................................16  

3 Market Assumptions ................................................................................................................................18  

3.1 New market structure ..........................................................................................................................18  

3.2 Grain Express ......................................................................................................................................19  

3.2.1 Performance of Grain Express .....................................................................................................19  

3.2.2 Implications for the GIG Investment Proposal .............................................................................20  

3.3 Drivers for competition ........................................................................................................................20  

3.3.1 Changes in Grain Production .......................................................................................................20  

3.3.2 Grain Grower Viability ..................................................................................................................22  

3.3.3 Marketing Options ........................................................................................................................24  

3.3.4 Supply Chain Options ..................................................................................................................25  

3.4 Implications for scenarios ....................................................................................................................26  

3.5 Policy implications ...............................................................................................................................27  

3.5.1 WEMA Access Undertaking and Grain Express ...........................................................................27  

3.5.2 WEMA and the WA Transportation Act .......................................................................................28  

3.5.3 Grain Market Deregulation ...........................................................................................................28  

3.6 Conclusions.........................................................................................................................................29  

4 Technical and Cost Assumptions ...........................................................................................................30  

4.1 Scenario Verification ...........................................................................................................................30  

4.2 Key Assumptions ...............................................................................................................................31  

4.2.1 Common Assumptions of GIG scenarios ....................................................................................31  

4.2.2 Capital ..........................................................................................................................................33  

4.2.3 Operating Costs ............................................................................................................................33  

4.3 Operating Parameters ..........................................................................................................................33  

4.4 Below Rail Assumptions .....................................................................................................................35  

4.4.1 Capital Expenditure .......................................................................................................................35  

4.4.2 Operating Expenditure ..................................................................................................................36  

4.5 Below Road Assumptions ...................................................................................................................39  

4.5.1 Capital Expenditure .......................................................................................................................39
### Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB</td>
<td>ABB Grain Ltd</td>
</tr>
<tr>
<td>ACCC</td>
<td>Australian Competition and Consumer Commission</td>
</tr>
<tr>
<td>APW</td>
<td>Australian Premium Wheat</td>
</tr>
<tr>
<td>ARG</td>
<td>Australian Railroad Group (A Division of Queensland Rail)</td>
</tr>
<tr>
<td>ATC</td>
<td>Australian Transport Commission</td>
</tr>
<tr>
<td>AWB</td>
<td>AWB Limited, formerly Australian Wheat Board</td>
</tr>
<tr>
<td>CBH</td>
<td>Co-operative Bulk Handling Ltd</td>
</tr>
<tr>
<td>EGR</td>
<td>Eastern Goldfields Railway</td>
</tr>
<tr>
<td>FOB</td>
<td>A shipping term which in the context of this study stands for “Free on Board” and indicates that the supplier or exporter pays the shipping costs from the point of production to the point where the product is loaded onto a vessel, at which point the buyer takes responsibility.</td>
</tr>
<tr>
<td>GIG</td>
<td>Grain Infrastructure Group</td>
</tr>
<tr>
<td>GNR1000</td>
<td>Grain Network Review recommendation to close selected lines totalling nearly 1000km</td>
</tr>
<tr>
<td>Grain Express</td>
<td>Grain Express is a mandatory grain supply coordination and transport service that CBH provides for all users of their system</td>
</tr>
<tr>
<td>Grain Pool</td>
<td>Grain Pool Pty Ltd is CBH’s wholly-owned grain marketing subsidiary</td>
</tr>
<tr>
<td>GTK</td>
<td>Gross tonne kilometres (gross tonnes multiplied by distance travelled)</td>
</tr>
<tr>
<td>GVM</td>
<td>Gross Vehicle Mass</td>
</tr>
<tr>
<td>MRWA</td>
<td>Main Roads Western Australia</td>
</tr>
<tr>
<td>NTK</td>
<td>Net tonne kilometres (net load multiplied by distance travelled)</td>
</tr>
<tr>
<td>VKT</td>
<td>Vehicle kilometres travelled</td>
</tr>
<tr>
<td>WADAF</td>
<td>Western Australian Department of Agriculture and Food</td>
</tr>
<tr>
<td>WALGA</td>
<td>Western Australia Local Government Association</td>
</tr>
<tr>
<td>WEMA</td>
<td>Wheat Export Marketing Act</td>
</tr>
<tr>
<td>WEA</td>
<td>Wheat Exports Australia</td>
</tr>
<tr>
<td>WNR</td>
<td>WestNet Rail - lease holder and operator of Western Australian rail track network</td>
</tr>
</tbody>
</table>
1 Executive Summary

Background
The Department of Infrastructure, Transport, Regional Development and Local Government (the Department) requires an independent review of the Grain Infrastructure Group’s (GIG) Freight Network Review report on the grain industry in Western Australia. The objective of the independent review is to test the veracity of the assumptions and conclusions drawn by the GIG and to inform the Department on the appropriateness of the GIG’s recommendations, with particular emphasis on the level of infrastructure funding recommended to support rail and road transport of grain.

The independent review has been led by KPMG with Saha International (SAHA) assessing the technical, cost and market assumptions that underpin the GIG report.

The GIG Review was conducted over several years (2004-2008) and a number of factors, particularly with regard to the grain market have since changed. The GIG’s original report was prepared during a period when Australia’s export grain market was regulated, and grain marketing and handling in Western Australia operated in a comparatively stable environment. A small number of participants made decisions regarding the transport, storage and shipping of grain. Since the development of the GIG report, a number of significant changes have occurred in Australia’s grain market, placing further pressure on the grain supply chains across the nation. While the GIG’s proposal has been modified to recognise some of these changes, the deregulation of the export wheat market in 2008 and the accreditation of 23 new wheat exporters have led to major changes in market behaviour. As a consequence this has put unexpected pressure on the grain logistics chain which was not anticipated by the GIG Review.

Key Findings
- Recent deregulation of the export wheat market and the emergence of independent traders will encourage the market to seek the least cost paths to port or to domestic customers, reflecting the change from production driven to demand driven supply chain solutions.
- As the supply chain refocuses towards cost and service benefits, the control of grain volume and allocation to transport mode by Co-operative Bulk Handling (CBH) is diminishing, thereby weakening the intent behind the recently introduced Grain Express initiative. The role of CBH as the coordinator of the logistics chain should therefore be reviewed.
- The operating environment for rail including lower payloads than road on many routes, poor track condition, deteriorating cycle times and the pressure to move greater volumes during a compressed period are reducing rail’s ability to compete on both service and price.
- Road cartage is becoming increasingly competitive with greater payloads relative to rail on a number of routes, higher average speeds, improved opportunities for backloading and a greater scope for deployment outside the season. As such road is likely to continue to erode rail’s market share.
- Road vehicle operating costs in WA are at least 30% lower compared to grain markets in other states due to the larger vehicle combinations allowed in WA.
- These conclusions undermine some of the fundamental premises of the GIG analysis, in particular that volumes would be retained on rail with or without line closures, and CBH through its storage and handling
network and supply chain coordination would be able to control and direct volume to rail to ensure any new investment would be supported.

- It seems apparent that rail volumes on some lines will not sustain the proposed investment, particularly in areas where road can effectively compete. A further review of additional line closures should therefore be considered.

- Growers will seek other opportunities to capture supply chain savings by holding grain in on-farm storage and pursuing direct marketing options with domestic buyers or container packers. This may also facilitate better utilisation of their own vehicles, delivering further benefits.

- The prospect of grain leakage away from those lines identified for upgrade is therefore high. Despite the promising forecasts for future grain production, this will tend to be in areas away from those identified for investment by GIG.

- Our review of many of the costs and nominated benefits proposed through the GIG analysis suggest that the investment required may be higher than originally nominated – particularly to complete the rail resleepering programme. Furthermore, the benefits of avoided capital expenditure on roads may not be realised if road attracts greater volume.

- Regulating grain to rail by way of road restrictions or higher permit costs will only serve to further erode grower returns and increase the pressure on Governments for greater investment in rail infrastructure.

- In view of the limitations for rail to meet current and likely future demand, further work should be undertaken to ensure there is adequate infrastructure at port(s), upcountry and within the road network for road haulage to provide the necessary surge capacity.

**Approach**

The GIG Review identified a number of shortcomings in the existing grain freight network. These were primarily in the areas of track degradation rendering large parts of the network unfit for purpose. The GIG Review assessed a number of track upgrades and track closures with complementary road upgrades, on the basis that these would ensure a more efficient and sustainable grain freight network.

To test the veracity of the recommendations, SAHA has reviewed the underlying market conditions including production forecasts, market structure, control, and the role of CBH’s Grain Express initiative. We have then attempted to identify the various cost and operating assumptions underpinning the business case for the investment in order to assess whether the investment is appropriate to the required task, and whether the estimated cost associated with each recommendation is realistic and still valid.

The business case for investment in the grain freight network is derived from the following key elements:

- Volume through the network
- The capacity of the network
- Project scope for improvements to the network
- Capital costs for the nominated projects
- Operating costs for the network

In our assessment of the GIG Review recommendations, we have not made any assumptions about how the new market conditions may impact upon individual rail lines as this is neither within the scope or feasible within the available timeframe. Although we are of the view that these market changes will have a significant impact on how the grain freight network will operate.
Summary of Key Assumptions

The following tables provide a summary of our comments on key assumptions made by GIG.

### MARKET ASSUMPTIONS

<table>
<thead>
<tr>
<th>Market Structure</th>
<th>Original GIG Assumptions</th>
<th>SAHA Comment on Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Production</td>
<td>• Grain production will continue to increase despite climate change</td>
<td>• Agreed, although grain production will generally increase in the medium to higher rainfall areas, resulting in a production shift to the western and southern areas of the wheatbelt.</td>
</tr>
<tr>
<td></td>
<td>• Grain growing will continue to remain profitable despite declining terms of trade</td>
<td>• Grain growing will remain viable over the long term provided recent price increases continue. Price fluctuations and variable rainfall will place further pressure on growers in the low rainfall, eastern wheatbelt.</td>
</tr>
<tr>
<td>Market Demand</td>
<td>• 80% of WA grain is currently bound for export</td>
<td>• Growth in the export freight task is consistent with WA Department of Agriculture and Food’s estimates, although as grain production rises, it will increasingly be drawn from western and southern areas.</td>
</tr>
<tr>
<td></td>
<td>• Average grain export freight task will grow from 10mt p.a. by 1-2% p.a.</td>
<td>• As more grain will be produced closer to port, there is potential for larger volumes to be moved by growers using their own vehicles.</td>
</tr>
<tr>
<td>Control and Power</td>
<td>• Coordination of the supply chain by a single coordinator with equitable access and services to all customers will minimise the supply chain costs and risks of increased volumes moving away from rail to road (leakage)</td>
<td>• CBH’s Grain Express has been introduced as the vehicle to optimise the grain supply chain. Grain Express is under enormous pressure in this first year of wheat export deregulation. With the requirement for CBH to gain ACCC approval for its Access Undertaking, there will be pressure to unwind Grain Express and allow traders to make their own transport arrangements. As a result, there will likely be greater leakage of grain from the CBH/ARG network.</td>
</tr>
<tr>
<td>Supply Chain Cost Structure</td>
<td>• Land transport costs account for 6-12% of product value (FOB)</td>
<td>• Total supply chain costs typically represent between 13 and 26% of product value. Growers are therefore looking to mitigate these costs by operating their own trucks, building on-farm storage, and by securing lower cost, non-export markets for their grain. This behaviour is also being encouraged by some grain traders who are being financially impacted by the current system delays. Again there is a high potential for grain leakage away from CBH/ARG.</td>
</tr>
<tr>
<td></td>
<td>• Storage and handling costs account for around 7-14% of product value (FOB)</td>
<td></td>
</tr>
</tbody>
</table>
## TECHNICAL AND COST ASSUMPTIONS

<table>
<thead>
<tr>
<th>Below Rail</th>
<th>Original GIG Assumptions</th>
<th>SAHA Comment on Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital expenditure</td>
<td>• 1:4 sleeper replacement</td>
<td>A 1:4 replacement strategy is a common cyclical maintenance strategy.</td>
</tr>
<tr>
<td><strong>If lines closed</strong></td>
<td>• No re-sleepering on grain branch network or closed line</td>
<td>WestNet has undertaken some work on the network and has moved to replace 1:2 sleepers on a number of lines.</td>
</tr>
<tr>
<td></td>
<td>• No funding required</td>
<td>Unit costs for sleepers and materials have increased since the original estimate was prepared.</td>
</tr>
<tr>
<td><strong>If lines open</strong></td>
<td>• 1,721 total km to be re-sleepered</td>
<td>WestNet has revised and reduced the recommended length of line to be re-sleepered from close to 2,200kms to approximately 1,600kms.</td>
</tr>
<tr>
<td></td>
<td>• Total Cost $200m</td>
<td></td>
</tr>
</tbody>
</table>

| Operating expenditure | • Majority of costs are system costs and only avoidable on line closure | Consultation with WestNet suggests significant savings could be achieved each year should all grain network lines be closed. However, if only partial network closure were to occur the costs would not be avoided and there would be minimal savings. |
| | • Fixed mainline costs have been allocated to branch lines | |
| | • No reference made to opex expenditure in the report | |

<table>
<thead>
<tr>
<th>Below Road</th>
<th>State Roads</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital expenditure</td>
<td>• Widen parts of state road network to 7m to accommodate vehicles up to 107.5t gvm if lines are closed</td>
<td>GIG costs used are based on the Lowes Churchill and Associates Road Impact Analysis Report (2006) which was subsequently indexed by 21% to cover increases in cost. This cost indexation is in line with industry benchmark cost increases of between 15% and 20%.</td>
</tr>
<tr>
<td></td>
<td>• $139,000 – 190,000 per km for road widening</td>
<td>The underlying cost estimates for road widening projects may be appropriate. However, they are significantly lower than WA Main Roads average per lane km road construction costs for rural main roads in 2007-08 which was $465,814 per km. Capex requirements are highly sensitive to road widening costs which make up the vast majority of projects.</td>
</tr>
<tr>
<td></td>
<td>• $209,000 – 363,000 per intersection improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• $1.4m – $1.5m per project for other road improvements</td>
<td>No information on other traffics or benefits derived from road improvements was provided, so these could not be assessed.</td>
</tr>
<tr>
<td><strong>If lines closed</strong></td>
<td>• 633km of road to be widened</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 12 intersections to be upgraded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 19 other road improvements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Total expenditure if lines closed $151m</td>
<td></td>
</tr>
<tr>
<td><strong>If lines open</strong></td>
<td>• 284 km of road to be widened</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2 intersections to be upgraded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 14 other road improvements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Total expenditure $63m</td>
<td></td>
</tr>
<tr>
<td>Local Roads</td>
<td>Concerns have been made about the accuracy of cost estimates for local road improvements, but these have not been subjected to detailed analysis on the basis that these improvements would be required under both the lines open and lines closed scenarios.</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Operating expenditure</strong></td>
<td>A variety of figures have been provided in relation to road maintenance costs but it is unclear how these have been integrated into overall cost estimates. The original Road Impact analysis suggested that investment would result in lower maintenance costs however no quantum of savings has been indicated. The GIG model included potential provision for savings but these were not completed or utilised in the report.</td>
<td></td>
</tr>
<tr>
<td><strong>If lines closed</strong></td>
<td><strong>If lines open</strong></td>
<td></td>
</tr>
<tr>
<td><em>$23m road maintenance expenditure (GIG Report)</em></td>
<td><em>$10.6m road maintenance costs (WALGA)</em></td>
<td></td>
</tr>
<tr>
<td><strong>If road improvements implemented</strong></td>
<td><strong>If road improvements implemented</strong></td>
<td></td>
</tr>
<tr>
<td><em>$3m reduction in road maintenance costs (GIG model)</em></td>
<td><em>No specific reference in the report</em></td>
<td></td>
</tr>
<tr>
<td>Above Rail</td>
<td>Higher volumes could require additional fleet investment to provide required rail capacity. Potential utilisation will be lower than expected if track restrictions, compression of the season or if high levels of repositioning for loads continues to occur – these factors could, in turn lead to a requirement for additional rolling stock to meet current volumes.</td>
<td></td>
</tr>
<tr>
<td><strong>Capital expenditure</strong></td>
<td>The initial model makes reference to 11 locomotives due for replacement in 2015 at a cost of between $3m and $4m each. This is a conservative cost for locomotives based on low end Chinese build locomotives - the average cost for US build locomotives are now closer to $6m. No further breakdown of above rail capital expenditure is provided. It is noted that the average age of wagons in grain traffic is close to 25 years, and no additional capital for wagon replacement appears to have been considered. Rolling stock is dedicated to the grain traffics and cannot be deployed into other revenue earning business when not fully utilised.</td>
<td></td>
</tr>
<tr>
<td><strong>Operating expenditure</strong></td>
<td>There are unlikely to be major changes in variable input costs (labour, fuel etc) since the</td>
<td></td>
</tr>
<tr>
<td><em>New locomotive capital will be required during next 10 years on both standard and narrow gauge lines</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>No further investment in wagons required</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• New locomotive capital will be required during next 10 years on both standard and narrow gauge lines</td>
<td>• No further investment in wagons required</td>
<td></td>
</tr>
<tr>
<td>• No further investment in wagons required</td>
<td>• No specific reference in the report</td>
<td></td>
</tr>
</tbody>
</table>
analysis was undertaken. High track access charges, particularly on Merredin feeder lines could limit the ability to attract more volume to rail or for rail to remain viable relative to road.

Potential for poor utilisation as a result of regular speed restrictions and adhoc repositioning of fleets, will result in higher costs and required recovery from the grain sector.

| Above Road | **Capital expenditure** | The report suggests the need for additional investment in the industry, based on assumed continued use of B Doubles with 50t payload. Anecdotal evidence during the review indicated that higher mass limit (62t – 75t) vehicles are increasingly being utilised – this will result in fewer additional vehicles being required. |
| **Operating expenditure** | • No specific reference in the report |  |
|  |  | High payload relative to rail and higher average speed on networks are key drivers towards diversion of volume off rail. The GIG assessment appeared to assign a round trip cost for road to grain traffic – market sources suggest that backloads for grain are frequently achieved making road even more competitive with comparable rail rates. Industry sources advise that a high proportion of road vehicles in the WA grain transport industry are farmer owned (with a number of significant fleets) and that this vehicle fleet is growing. As the primary task for the farmer is to clear the crop from paddocks during harvest, many farmers attempt to recover the total cost of capital of the vehicles over this activity alone. Therefore any use of the vehicle for the remainder of the season e.g. from storage to port may only need to cover the direct operating cost. No major changes in input costs. The current model may underestimate vehicle utilisation. This would result in an overstatement of the capital cost that would need be recovered per tonne. As a result, the road cost per tonne could be lower than estimated, increasing the risk of rail bypass. |
| Storage and Handling | **Capital expenditure** | Initial capital expenditure covered 117 sites including 18 rapid rail loaders. Review of current sites indicates 18 rapid rail load sites are now operational. It is unclear as to whether additional rapid rail loader investment is required. Discussions with CBH suggest that the cost of |
|  | • Investment is required in rapid rail loaders to improve rail efficiency and capacity • Improved access to road and rail loading facilities on site for |  |
all scenarios
• CBH estimates additional road/rail and level crossing costs of $40m (indexed by 21%) external to their sites

If lines closed
• Remove rail and re-bitumen for trucks. No further investment in rapid rail loading would be required on closed lines
• Conversion of rail load sites for road load out required

If lines open
• Capital includes ground conveyors, extended loop lines and 18 new rapid loaders

Overview of the Market

• The prospect for increased grain production in WA over the next 25 years is good, although these increases will occur in the southern and western areas of the wheatbelt and will not result in greater tonnages being delivered to many of the branchlines that are the focus of the GIG analysis;

• Grain growing should remain profitable for growers in the medium-high rainfall areas, especially if recent price increases are maintained;

• The risk of system by-pass is high because:
  o Supply chain costs can represent between 13% and 26% of the product’s value so growers will seek to reduce these costs where possible through the increased use of on-farm storage, direct delivery to port and pursuing other lower cost marketing activities;
  o While the grain export freight task will rise over time, increasingly growers will move more grain direct to port by road and rail’s share of the export task is likely to continue to fall;
  o The new market structure has resulted in increased shipping demand in the early part of the year which has had a flow-on effect in the demand for transport resources. The GIG modelling does not cater for increased tonnages beyond an export task of 10mt p.a. or for surge capacity. Surge capacity is largely being provided by additional road movements, which demonstrates the capacity for road to further supplant rail where required;
  o CBH’s management of Grain Express and the allocation of shipping capacity has been criticised and support for these initiatives is waning among some grain growers and traders because of the shipping delays being experienced;
  o Shipping delays this year have reportedly been a cost to exporters, with some traders and growers canvassing alternate storage, transport and shipping options to gain greater control over costs through avoiding parts of the CBH/ARG network;
  o Traders are citing overseas experience in deregulated grain markets where inefficient and expensive supply chains are not tolerated and are actively by-passed – they forewarn that this will happen in WA.

rapid rail loaders has quadrupled since the GIG Review was completed raising the question of whether further investment will occur and if so, how the cost will be recovered.

Capital investment estimates for the lines closed scenario appear to be approximate only with little or no detail provided on the actual improvements required on a site by site basis. Estimated cost to relocate a loader if a line was closed is approximately $1m per relocation.

CBH appear to have included storage and other onsite improvements in their capital estimates, along with off-site road/rail and level crossing estimates. Breakdown by project per site was not available. During the review a request of CBH for recent and future planned investment was made however no information was provided.

Report notes the same expenditure for both lines open and lines closed scenarios, however projects will differ as noted.
Revised Cost Estimates

Our review has highlighted that there are major cost discrepancies between the original GIG model, the GIG report and our estimates for a number of scenarios in the following areas:

- **Below Rail Capex (re-sleepering)** – Our estimate is 25% higher than the original GIG report estimate for all lines remaining open. The increased costs based on new rates provided by WNR but also include a slightly higher sleeper cost reflected in WNR’s submission to the Economic Regulation Authority. However, our total estimate is lower for the Close 1000 line scenario despite the higher sleeper costs, as WNR have reviewed the distance being re-sleepered downward.

- **Below Road Capex (State)** – Our estimate for state roads is over double that for both scenarios as reported in the GIG model and the GIG report. We have taken a conservative view and utilised actual average road improvement and construction costs to support both safety and regional development as reported by the Main Roads of WA (MRWA) in their 2008 Annual Report.

- **Below Road Capex (Local)** – Our estimate for the line closed scenario is less than that in the GIG report and 30% higher than the GIG model. Again, average actual costs from the MRWA Annual Report were used by SAHA, while the GIG model used pro-rated workings from a sample set. The GIG report estimate, while closer to SAHA’s estimate is also based on the GIG model but increased by $100,000. No rationale for this adjustment was provided.

- **Below Road Opex (State and Local)** – Insufficient detail was provided to test the GIG model assumptions and no estimates can be provided with any degree of certainty.

- **Above Rail Capex and Opex** – Insufficient detail was provided by ARG and WNR to validate the GIG model estimates. However, due to increasing inefficiencies around rail utilisation (including speed restrictions, repositioning etc) and the increasing capital cost of locomotive power and rolling stock, we believe that both operating and capital costs may be understated for above rail.

- **Above Road Capex and Opex** – Our estimates vary by as much as 25% higher than the GIG model capex estimates for some scenarios and as much as double that for opex estimates. The reason for the variance is the GIG model does not reflect the likely market position of complete bypass where significant volumes of grain will be moved direct to port.

- **Storage and Handling Capex** – Updated current and planned rapid rail loading investment information was not provided by CBH. In order to provide some guidance SAHA has indexed the model estimates by 21% to cater for increased costs since the modelling was conducted. These estimates therefore embed any optimistic growth in the storage network which may no longer apply in a deregulated market. Insufficient data has also been provided on estimates for off-site road/rail and level crossing expenditure. It is unclear how these relate to other road/rail capex estimates.
2 Introduction

2.1 Approach

The GIG Review identified a number of shortcomings in the existing grain freight network. These were primarily in the areas of track degradation rendering large parts of the network unfit for purpose. The GIG Review assessed a number of track upgrades, and track closures with complementary road upgrades on the basis that these would ensure a more efficient and sustainable grain freight network.

In order to test the veracity of the individual recommendations, SAHA has assessed each on two levels. First we have assessed whether each individual upgrade is appropriate to the required task, and second we have assessed whether the estimated cost associated with each recommendation is correct.

In our assessment of the recommendations of the GIG Review, we have not made any assumptions about how the new market conditions may impact upon individual lines, even though these market changes are having a significant impact on how the grain freight network is being required to operate. We do however consider the veracity of the market assumptions being made by GIG on the overall operation of the freight network.

The scope of SAHA’s role is to provide an update and assessment of the impact of the Market Assumptions and to review the Technical and Cost Assumptions in the GIG report.

2.2 Market Assumptions

The scenarios put forward by the GIG are contingent on a number of market assumptions, including the capture of significant tonnages to key rail infrastructure. With grain growers’ terms of trade in decline, growers are continuing to seek any opportunity to minimise their cost base in taking grain to market and are expected to behave differently in the recently deregulated wheat market. We have therefore tested all of the market based assumptions used in the GIG analysis within this new market environment.

A four stage process has been taken to review the market assumptions:

Table 1 Validation process for market assumptions

<table>
<thead>
<tr>
<th>1. New Market Structure</th>
<th>• Assess impact of the new market environment on traditional structural and commercial arrangements.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Drivers for Competition</td>
<td>• Test assumptions being made about future grain production for different regions. Analyse grain growers’ financial drivers in the new marketing environment with emphasis on their marketing and supply chain options.</td>
</tr>
<tr>
<td>3. Implications for Scenarios</td>
<td>• Assess the impact of any potential changes in grower marketing and supply chain behaviour on the GIG scenarios. Identify where they are likely to be most affected and the possible financial consequences.</td>
</tr>
</tbody>
</table>
4. Policy Implications

- Determine whether there are likely to be any policy implications through changes in grain trader or grower behaviour in this new market environment. Assess whether the current market structure in WA is sustainable over the longer term.

2.3 Technical and Cost Assumptions

SAHA’s approach to this task has been to identify and validate the technical and incremental resource cost assumptions that are part of the GIG’s analysis. However, it should be noted that this has not included any financial cost analysis, such as the cost of capital.

The technical and cost analysis undertaken by the GIG has been built on the broad market assumption that volume would be retained in the system, that it would be fed to the rail network, and that the flows would be consistent with historical trends.

As such, the GIG has used costs based on inputs provided confidentially and separately by the three main supply side members of the GIG – CBH, ARG and WestNet (WNR), with other costs derived or estimated on the basis of previous studies or analysis by key stakeholders between 2003 and 2006. These capital and operating costs were incorporated to generate a total costs benefit comparison of the various investment options.

A five stage process outlined in Table 2 has been utilised to review the technical and cost assumptions.

**Table 2 Validation process for technical and cost assumptions**

<table>
<thead>
<tr>
<th>1. Scenario Verification</th>
<th>• Ascertain the key scenarios assessed in the GIG analysis and verify whether they are still valid.</th>
</tr>
</thead>
</table>
| 2. Identify Assumptions | • Identify the major common assumptions which underpin the analysis.  
  • Identify cost assumptions and drivers (capital and operating) and capacity assumptions.  
  • Examine the materiality of these assumptions as they pertain to the business case for investment. |
| 3. Verify and Validate Scenario Outputs | • Consider the operating assumptions that support each scenario.  
  • Review the cost assumptions using appropriate rail and road industry benchmarks. |
| 4. Review Findings on Avoidable Costs | • Validate the GIG’s estimates of avoidable capital and operating costs of using road versus rail for each scenario, including the effect of incremental tonnage on roads.  
  • Test the risk and level of uncertainty associated with these findings. |
| 5. Conclusions | • Draw any conclusions about the GIG’s analysis and identify any alternative low cost scenarios which may become evident. |

The GIG model calculated total supply chain cost from commercial-in-confidence data received from stakeholders including the Department for Planning and Infrastructure (DPI), CBH, ARG and WNR. Their cost and operational data was used to calculate the Above Road, Above Rail, Below Road, Below Rail and
Storage and Handling costs. Each of these cost types was expressed as either an operational or capital cost in the model. Figure 2.1 outlines this approach.

**Figure 2.1: Evaluation approach of total supply chain cost (GIG)**

A review of the model and key components was undertaken to identify underlying assumptions however no audit of the model, its outputs or functions was undertaken as part of the review.
3 Market Assumptions

3.1 New market structure

The GIG Review was conducted during a period when Australia’s export grain market was regulated, with grain marketing and handling in Western Australia operating in a comparatively stable environment. Since then, significant changes have occurred in Australia’s grain market, placing further pressure on the grain supply chains across Australia. While the GIG proposal has been modified to recognise some of these changes, the deregulation of the export wheat market in 2008 and the accreditation of 23 wheat exporters has led to major changes in market behaviour.

In addition, the barley, lupin and canola grain markets in WA are also going through change with the announcement by the WA Minister for Agriculture of their deregulation later this year. This may result in more grain exporters entering this market, placing further pressure on the traditional WA grain supply chain.

The new market structure therefore involves multiple grain exporters, all seeking to independently export their grain as and when they desire. Most of this grain is accumulated in CBH storage during harvest, bought off growers in storage post-harvest, or traded in the secondary market whilst in store. Traders purchase grain via pools, for cash or may buy under contract. Each trader has their own marketing strategy, but a large proportion of Australia’s annual grain harvest is generally sold and shipped during the early months of the year, when world grain prices are usually higher due to the lack of competing grain from Northern Hemisphere exporters such as Canada, USA, the EU and increasingly, the Ukraine. This price spike is demonstrated in the pricing graph of 2008 Chicago wheat futures shown in Figure 3.1, where futures varied from a high of around 1125 USc/bu ($US413 per tonne) in Feb/Mar to 750 USc/bu ($US275) in Sept.

Figure 3.1: Chicago Board of Trade Wheat Futures - 2008

This market spike places extra pressure on the supply chain, especially now there are up to 23 wheat exporters all seeking to sell grain during this early period. Under the old market structure, AWB as the sole exporter would manage its selling program to take advantage of this pricing opportunity, but because it had full knowledge and control over wheat exports, it could smooth its shipping program across the country in line with port and transport capacity constraints. Under the new market structure, the multiple exporters, including CBH’s Grain Pool, are not only competing for sales in the international marketplace, but are jockeying for position in the export queue to avoid shipping delays, demurrage costs and other contractual penalties for late delivery.
3.2 Grain Express

In recognising the requirement to better manage the supply chain in the new environment, CBH developed a supply chain management model for 2008/09 called Grain Express. CBH lodged an exclusive dealing notification with the ACCC as Grain Express requires all growers and marketers to hand over grain supply coordination and transport services to CBH while their grain is in CBH’s custody. ACCC announced in September 2008 that it would not oppose CBH’s exclusive dealing notification for Grain Express on the basis that it is not likely to lead to a substantial lessening of competition in relevant markets. CBH therefore programs the storage, transport and out-turn of each owner’s grain from its 197 sites through to 15 destination points, including its 4 export terminals, regardless of where grain was received or bought. In order to operate Grain Express, CBH has secured rail services from ARG and trucking services from a number of road transport providers.

CBH’s submission to the ACCC was well supported by grower groups, transport operators, the WA State Government and many grain marketers/traders. Most of this support seems to have been based on the assurances made to growers and the market that “Grain Express delivers the only workable, affordable and flexible solution to the huge and urgent challenges facing the state’s grain export supply chain as grain markets undergo deregulation” (CBH release, July 2008).

3.2.1 Performance of Grain Express

The 2008/09 grain harvest has proved difficult with a large crop of over 12.3 million tonnes of grain produced and unseasonal weather during harvest resulting in delayed grower deliveries into the CBH storage system. Grain Express has had a difficult introduction given:

- delays in growers assigning or selling their grain to marketers;
- delays in the market selling grain and therefore making early vessel nominations for shipment;
- delays in CBH being able to pre-position grain at port for shipment due to hot weather train running restrictions;
- market uncertainty about the vessel allocation process and its lack of transparency; and
- perceptions about CBH’s allocation of shipping capacity to various marketers including its own marketing arm, Grain Pool Pty Ltd.

As a result, there have been significant shipping delays and costs incurred by the market due to the number of vessel nominations received over the early part of the year. By way of example, as at 20 March 2009 (CBH Daily Ship Roster), there were 5 vessels waiting to load at Kwinana, representing 130,000 tonnes of shipping, with a further vessel arriving that day. Four vessels were also waiting to load at Esperance, representing over 150,000 tonnes of shipping through that port.

Exporters have complained about Grain Express, the allocation process and CBH’s management of these issues. CBH has acknowledged it has been difficult meeting the demands of the market and needs to work through and revise its vessel allocation process in light of the changed market environment. CBH recognised that it underestimated how the market would operate in the new environment and its capacity to respond to these needs. (Farm Weekly, 5 March 2009)

Despite Grain Express, this year has shown a disconnect between market demand and supply chain capacity, especially during the early shipping months where rail capacity and its ability to provide surge volumes was out of step with market requirements. CBH has said that without Grain Express the situation would have been much worse, as in the past it has been asked to source grain from up to 40 sites at once and there would have been inefficient management of scarce transport resources resulting in further loss of
capacity. CBH also argues that it would have been better able to respond to this demand had the GIG investment occurred when it was first developed some years back – although it has not quantified the extent to which the GIG investment would have produced a better outcome this year.

Given the criticism from some exporters and international customers about these delays, CBH has supplemented its core transport assets by engaging additional trucks to haul surge tonnages to all ports. Former CBH CEO Imre Mencshelyi also took the unprecedented action of calling for private operators to make their trucks available to assist with this movement task (ABC Rural, 16 March 2009). As a result, CBH has achieved record tonnages through its ports during March by moving and shipping 1.54 million tonnes. CBH has also announced a temporary revision of its shipping allocation system where marketers are asked to submit EOIs in order to book shipping slots. EOIs would be assessed in relation to each port zone’s capacity, along with the marketer’s entitlement and prior shipping performance (CBH release, April 2009).

The review team in discussions with a number of growers and exporters heard of concerns about the management and operation of Grain Express and been confidentially told that many previous supporters would be unlikely to support its retention in the future. Reasons for their position are varied, but most relate to:

- CBH’s response to the market’s advice on how to address issues with the allocation process;
- lack of transport planning to meet market requirements despite what they feel has been adequate notice;
- alleged favouring of Grain Pool vessel allocations;
- lack of transparency in the allocation process and in decisions taken to re-order vessel queuing;
- a belief that the allocation process discriminates against grain traders as opposed to marketers who operate pools; and
- lack of preparedness to accept financial responsibility for its actions and/or poor performance.

### 3.2.2 Implications for the GIG Investment Proposal

Importantly, performance delivery under Grain Express so far this year has resulted in a number of market players signalling their lack of confidence with this arrangement, with several indicating they would not support retaining this initiative if asked by the ACCC. One exporter has even suggested that the answer to improved shipping capacity through CBH’s terminals is by allowing the market to secure its own transport assets, as is done elsewhere in deregulated grain markets. This signals there is growing potential for leakage from the upcountry storage and handling system, and the grain rail network.

### 3.3 Drivers for competition

#### 3.3.1 Changes in Grain Production

GIG modelling is dependent on the capture of grain into CBH’s network. One of the drivers for grain by-passing CBH’s network or the traditional supply chain are the changing trends in grain production. To assess this potential, we asked the WA Department of Agriculture and Food (WADAF) about the future prospects for grain production in the state given the various climate change scenarios being developed, along with the impact of R&D on the potential for grain production in the different regions. WADAF’s Grain Industries Development team advised that the prospects for continued grain production in WA look most promising under just about any scenario over the next 25 years.
While production variability may increase in future years due to the impact of climate change, especially in the lower rainfall areas of less than 350mm p.a., WADAF estimates the average change in overall production over the next 25 years will be as follows:

Table 3 : WADAF Estimates of Future Grain Production

<table>
<thead>
<tr>
<th>Estimate (million tonnes)</th>
<th>Increase</th>
<th>Total</th>
<th>Average % increase p.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Baseline</td>
<td>14.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>4.9</td>
<td>18.9</td>
<td>1.4%</td>
</tr>
<tr>
<td>Low</td>
<td>2.3</td>
<td>16.3</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

In reviewing ABARE farm survey results generated through the Australian Agricultural and Grazing Industry Survey (AAGIS) for the period 1990-2007, there has been demonstrated growth in the cropping industry for the two wheat growing regions of WA, namely the North and East Wheat Belt (NE), and the Central and South Wheat Belt (CS).

The key results for these two regions are presented in Tables 1 and 2 in Appendix B. The main points are:

- Total farm area (ha) increased by around 2% per annum in the CS region, while in the NE there appeared to be no discernible change in farm area. On average, total farm area in the NE region are about double those in the CS region.
- For both regions, the total area sown to crops increased strongly, averaging 3.1% p.a. for the NE and 3.6% for CS.
- For the NE region, there appeared to be a marked swing away from sheep production to cropping, with sheep numbers declining by around 1.24% pa and total crop area as a proportion of total farm area increasing by 3.3% pa, suggesting a substitution of crop production for sheep production. Wheat yields (t/ha) for the NE increased at an average annual rate of 0.8%.
- For the CS region, while there was a swing away from sheep production to cropping, the decline in sheep numbers was lower at 0.6% pa than in the NE region. However, the 2% p.a. increase in farm area contributed to a 3.6% p.a. increase in total area cropped, resulting in a 1.7% p.a. growth in the proportion of total farm area devoted to cropping. Wheat yields for the CS region increased at an average annual rate of 0.6%.
- Annual farm cash income per hectare (FCY/ha) was higher for farms in the CS region averaging around $49 (in $2006-07) compared with farms in the NE region where FCY/ha averaged $36.

The main factors contributing to the growth of cropping would appear to be:

- Productivity growth in the cropping industry attributable to improved wheat varieties and tillage technology, and
- More favourable prices for crop products relative to sheep products have encouraged farmers to substitute cropping for livestock activities.

WADAF’s estimated growth in production is broadly consistent with the implicit assumption being put forward by GIG that there will be continued growth in grain production in WA. As shown above, WADAF’s high production estimate assumes an average growth over the next 25 years of around 1.4%, while their low production growth is around 0.7%. However, the GIG identifies growth in the export grain freight task (Exhibit 2 as reproduced in Table 4) based on assumptions that 80% of the crop is exported and the export freight task will grow from the present 10mt pa by 1-2% p.a. By implication, GIG’s grain production estimates for a peak season are higher than WADAF’s estimate.
Table 4: GIG Future Grain Freight Task (reproduced from Exhibit 2)

<table>
<thead>
<tr>
<th>Grain Freight Task</th>
<th>2005</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Season</td>
<td>10 mt</td>
<td>15 mt</td>
</tr>
<tr>
<td>Peak Season</td>
<td>15 mt</td>
<td>25 mt</td>
</tr>
</tbody>
</table>

However, the key question is where will this increased grain production occur? WADAF’s analysis of projected production changes is concerning for the GIG analysis, in that they believe it will shift further west and south over time. WADAF have provided indicative maps to demonstrate this trend as shown in Figure 3.2.

Figure 3.2: WA Grain Production Shift

![Low Estimate: 16.3mt](image)

![High Estimate: 18.9mt](image)

So while the overall news is positive about future grain production in WA, these models indicate that the additional tonnage will be located closer to port.

This suggests that in future years of higher grain production, there will be little increase in tonnage to support a number of those branchlines identified for investment by the GIG modelling, such as the Newdegate/Lake Grace, Bullaring/Merredin, Kondinin/Merredin, Trayning/Merredin, Maya/Perenjori and Amery/Beacon/Kalannie lines. It is also likely that as the increased tonnage will be located closer to port, it will be actively sought in the contested new market environment.

3.3.2 Grain Grower Viability

Another driver for future grain production is the profitability of grain growing in WA, along with the capacity for growers to meet the rising off-farm supply chain costs such as storage, handling and transport moving forward. Again we asked WADAF to provide information relating to grain growing profitability, and they have
assisted in providing typical operating costs for a grain enterprise in the medium rainfall production area (between 450-325mm annual rainfall). Using WADAF’s analyses, along with historical pricing figures derived from ABARE reports, we have determined typical grain cropping margins for medium rainfall and low rainfall areas of the WA wheatbelt as shown in Table 5. We have also looked at the impact that changing wheat prices and increased off-farm supply chain costs may have on the profitability of grain growing across the two regions concerned.

Table 5: Price, yield and supply chain cost sensitivities on grower gross margins in medium and low rainfall regions

<table>
<thead>
<tr>
<th>Production Zone (Rainfall Zone)</th>
<th>2006 Gross Margin</th>
<th>2008 Gross Margin</th>
<th>Price, Yield and Supply Chain Cost Sensitivities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Pool Return 1 ($/t)</td>
<td>Med</td>
<td>Med</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>$240</td>
<td>$325</td>
<td>$200 (low)</td>
</tr>
<tr>
<td>Net Pool Return 1 ($/t)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average Off-farm Supply Chain Costs 2 ($/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBH S &amp; H ($/t)</td>
</tr>
<tr>
<td>Transport ($/t)</td>
</tr>
<tr>
<td>Sub-Total Supply Chain Costs ($/t)</td>
</tr>
<tr>
<td>Net Farm Gate Return ($/t)</td>
</tr>
<tr>
<td>Yield 3 (t/ha)</td>
</tr>
<tr>
<td>Net Income ($/ha)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Operating Costs ($/ha) figures rounded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertiliser</td>
</tr>
<tr>
<td>Spray</td>
</tr>
<tr>
<td>Fuel &amp; Oil</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total Operating Costs 4 ($/ha)</td>
</tr>
<tr>
<td>Net Margin ($/ha)</td>
</tr>
</tbody>
</table>

Comments on Table 5

1. Net Pool Return for ASW 10 in 2006 and 2008 derived from ABARE reports
2. Average storage and handling costs derived from CBH Charge Sheets for 2005/06, from SAFF Post-Harvest Comparative Analysis of Storage and Handling Charges, 2008 for 2007/08, and the 2006 and 2008 freight rates are derived from WADAF analysis. Sensitivity storage and handling costs are indexed by 10% from 2008/09, while freight costs are the Current Market Rate - Rail Viable Position freight cost as provided in the GIG report. These average off-farm supply chain costs do not include levy deductions, farm to bin freight costs, permit fees, etc
3. Average yield for medium rainfall wheat production is provided by WADAF, and for low rainfall areas from ABARE data
Total Operating Costs does not include depreciation, financing or any capex. For the sensitivity analysis, we have used typical costs as provided by WADAF for 2008/09 as these reflect a mid-range level of prices.

This analysis shows that grain growing on medium rainfall is generally profitable except when prices fall below, say, $240 per tonne, based on today’s input cost levels. In lower rainfall areas, growers are even more unprofitable at lower grain prices, and would need to reduce their on-farm input costs to improve profitability. Growers from both areas can make good returns at the higher prices reflective of recent price trends or with lower on-farm input costs.

Increased supply chain costs further erode margins for both groups, however the opportunity for growers to reduce the impact of these costs in the medium rainfall areas by hauling grain by road direct to port or local markets is generally higher.

On this analysis, off-farm supply chain costs (including farm to silo) represent up to 15% of growers total operating cost of production and between 14% and 26% of the modelled Net Pool Return (FOB) value. Growers are therefore incentivised to look for lower transport or storage options, especially where there may be the added benefit of securing better prices through different marketing options, as discussed below.

The underlying assumption in the GIG analysis that grain growing will remain profitable therefore holds true, especially for medium and higher rainfall areas of production and at the recent higher grain prices.

### 3.3.3 Marketing Options

A further driver for competition is the increasing number of marketing options becoming available for growers. WA’s grain growers have long been supporters of grain pooling, with over 80% of production being exported by AWB and the Grain Pool through the use of pools prior to deregulation. Growers have developed their enterprises based around a harvest payment (usually around 80% of the estimated pool return less supply chain costs, although with deregulation this has now reduced), with follow up pool payments over the life of a pool for up to 18 months after harvest. Many growers have structured their working capital around offering liens on their crop, endeavouring to pay this debt off with their harvest payment proceeds.

Increasingly, many growers are looking to sell outside the traditional export market and have established relationships with domestic users such as flour and stockfeed millers. These growers arrange direct delivery of grain to the mill door using their own transport. The potential for this market to grow is limited though, given the small population in WA.

One market which is growing, however, is the export container trade where growers are by-passing the CBH network and delivering grain direct to packers using their own farm trucks. This trade has developed over recent years due to lower ocean freight rates for container traffic relative to bulk shipments. Containerised grain has been deregulated for some years so traders have been using this opportunity to open up new markets for Australian grain and to work around the bulk export grain restrictions. While ocean freight cost relativities between bulk and container traffic have returned to more traditional levels, a significant new market for Australian grain has now been developed and continues to prosper, albeit at slightly lower tonnages. Market estimates suggest that around 600 twenty foot containers (13,200 tonnes of grain) are packed and exported from WA each week.

While WA growers have found pooling a favoured marketing option, deregulation has introduced more traders seeking to buy grain through cash bidding this year. WADAF estimate that around 30% of grain was sold for cash this year, which could grow to around 40% over the next few years, provided grain pools continue to
operate efficiently. This estimate is driven by the notion that growers only require a certain amount of cash flow at harvest and will continue to use pools as a longer term cash management option. Whether this is true or not, it signals the level of liquidity expected to be in this grain market, and the volume of grain (up to 4 – 5 million tonnes) that can more freely move outside the traditional pooling system if the trade wants.

The alternate marketing options of domestic flour and feed use, and container exports are generally based on cash or contract sales and are often serviced directly off-farm. These markets are not constrained to any particular growing region, although most of these users are located in the Kwinana port zone. Growers located in the western part of the wheatbelt are generally in a better position to avail themselves of these opportunities, but increasingly, growers from other regions will seek to mitigate their pricing risk by selling and delivering into these markets too.

3.3.4 Supply Chain Options
The WADAF estimates that there are currently around 2 million tonnes of on-farm storage in the state, which does not include the use of temporary storage such as silo bags. They further estimate that on-farm storage will continue to grow over coming years to between 3 and 4 million tonnes. The drivers for growers to build on-farm storage are varied, but the key one has been to quickly secure the crop in storage to avoid quality downgrading due to adverse weather conditions. Any delay in harvesting, in the transport to silo or in the receival process can place the crop at risk, so growers have invested in faster harvesting equipment, bigger chaser bins, larger trucks and in their own silos to ensure they can secure the crop as quickly as possible.

Changes in the supply chain such as silo closures, poor intake capacity, lack of segregations, and silo equipment breakdown has led to more growers building their own storage in order that they can better control their own supply chain. While sealed silo storages are expensive to build (up to $140 p.t.), loss of crop and the downgrading of grain from milling qualities to feed quality has the potential to cost growers tens of thousands of dollars. Using indicative yield figures provided above by WADAF, Table 6 shows the potential impact of weathering and downgrading a 100ha paddock of APW 10 quality wheat to Feed quality in a low rainfall area:

<table>
<thead>
<tr>
<th></th>
<th>Potential Crop</th>
<th>Downgraded Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>100ha x 1.43 t/ha = 143 t</td>
<td>100ha x 1.43 t/ha = 143 t*</td>
</tr>
<tr>
<td>Value</td>
<td>APW 10 = $300/t</td>
<td>Feed = $250/t</td>
</tr>
<tr>
<td>Total Value</td>
<td>$42,900</td>
<td>$35,750</td>
</tr>
<tr>
<td>Loss in Value</td>
<td>$7,150</td>
<td></td>
</tr>
</tbody>
</table>

* There is a view that weathering causes yield losses too, although these have not been quantified

At these prices, this loss in value would finance the building of around 50 tonnes of sealed on-farm storage, enough to store over one-third of the volume of grain potentially harvested off this paddock.

The other area of impact is the requirement for road transport. All growers have invested in farm trucks to enable them to run their normal farm business, so many growers see this essential investment as sunk capital and are generally looking for better utilisation of these vehicles in other off-farm activities.

Having on-farm storage and their own transport provides growers with the opportunity to take greater control of their supply chain, be it delivery to their local silo, their local port, or any of the other marketing options.
canvassed earlier. A growth in on-farm storage will therefore lead to more growers exploring these alternate marketing options.

Some growers may have a view that by delivering to port, they are able to capture freight savings over those charged by CBH. Even if they cannot deliver grain at the same transport cost, a share of the potential market price upside as indicated in Section 3.1 by selling for cash, on a delivered port basis, can be significant and more than off-set any additional transport costs.

Many growers also have a view that by investing in their own on-farm storage, they should not be paying the additional cost of unutilised upcountry storage when they deliver to CBH at port. A number of parties we consulted during the review complained about the cross-subsidisation of storages in the CBH network. They felt that this process hides the true cost of the system and that they should be able to avoid a large part of the upcountry component of CBH’s charges, which represents between $12 and $16 per tonne, if they deliver direct to port. Again, avoiding CBH’s upcountry storage and transport costs would help off-set growers’ own storage and transport costs.

Some growers further argue that if CBH reflected the true cost of the handling system in their charges, many sites would be closed, resulting in further efficiency savings for users of the network. The review team was unable to access information to support such a contention, but it is likely there would be wide variances in costs to operate 197 sites across the state, so there is potential for cross-subsidisation between sites.

The risk in continuing a policy of standard pricing is that other players have the opportunity to cherry-pick the network by investing in more efficient operations in key locations and capturing volume away from CBH and potentially the GIG supported network. CBH’s greatest protection against this is their hold over grain export terminal capacity, where they charge the full storage and handling fee for port deliveries. While this charging policy exists, there is less incentive for investment in upcountry private storage operations, as apart from potential freight savings, exporters cannot avoid CBH’s full charging structure.

During our review, we were advised of efforts by some growers (supported by some traders) to explore alternative export grain loading facilities. We became aware that growers and some traders:

- Have had discussions with the Geraldton Port Authority and Patrick Ports, and recently trialled an alternate loader to see whether it could be used to handle grain (Countryman, 11 May 2009);
- Were in discussions with the James Point Consortium at Fremantle to see whether their plans for a new break-bulk berth would have the functionality to load grain (PGA Release, 3 March 2009); and
- Had contacted the Albany Port Authority enquiring about opportunities to secure berth space for a potential temporary grain loader and spoken with an un-named third party about handling grain at Albany and Esperance (ABC Rural, 16 March 2009).

There is a view among some growers that CBH’s cooperative structure does not provide the right market signals for growers and users of the grain supply chain. As evidenced by recent comments from the WA Grains Group, they see opportunities for further change, and if that involves grain bypassing the traditional network in an effort to secure cost savings, then they will pursue that course (WA Grains Group Release, 19 April 2009).

### 3.4 Implications for scenarios

The behaviour of exporters under the changed market structure and the performance of Grain Express would suggest that there will be many marketers/traders and some growers eager to manage their own supply
chains in the belief that they will be able to do a better job and at a lower overall cost. The implications for the GIG’s partial rail closure scenario is that there is greater risk of these parties bypassing the CBH/ARG network and therefore fewer tonnes left to support the fixed cost base of the remaining network.

Our studies have supported the GIG’s contention that grain growing will remain profitable and that there will be increased export tonnages from WA. However, WADAF’s work shows that the increased volumes will come from the western/southern areas and will not provide additional tonnages on many of those lines identified by the GIG’s for investment. Further, as much of this production will be closer to port, the opportunity for growers to utilise their own vehicles and deliver direct to port will erode volume from the CBH upcountry network.

Supply chain costs can represent a large percentage of product value, especially in years of lower grain prices. The opportunity to save on these costs through by-passing the network will become greater as costs rise, further incentivising growers and traders to operate outside the traditional CBH-managed supply chain and to create their own supply chains, even possibly to the point of establishing alternate grain export facilities.

3.5 Policy implications

3.5.1 WEMA Access Undertaking and Grain Express

The new Wheat Export Marketing Act 2008 (WEMA) requires accredited wheat exporters who own export grain terminals to also pass the Port Terminal Access test. Up until 30 Sept 2009, the Port Access test requires bulk handlers inter alia, to comply with the continuous disclosure rules of providing details on its web-site regarding policies and procedures for managing demand for the terminal, and a daily updated shipping schedule.

From 1 October 2009, the Port Terminal Access test requires bulk handlers to again meet the continuous disclosure provisions, but to also provide an access undertaking under Division 6 of Part IIIA of the Trade Practices Act 1974, relating to the provision of access to the port terminal service for accredited wheat exporters. This access undertaking comes into operation once it has been accepted by the ACCC.

CBH being an associate of an accredited wheat exporter is therefore required to comply with the Port Terminal Access test. It is this test that CBH are having difficulty with in managing the vessel loading allocation system and its interface with Grain Express. As mentioned earlier, CBH sought ACCC approval for Grain Express and there is growing criticism about it and CBH’s management of the shipping program.

Regardless, CBH along with the other grain terminal operators will be required to secure ACCC acceptance of its Access Undertaking before 1 October if Grain Pool is to retain its wheat export accreditation. Access Undertaking acceptance is a public process, that has already commenced with the ACCC releasing an Issues Paper on 29 April and CBH, ABB Grain and GrainCorp having lodged Access Undertakings for ACCC consideration in April.

One of the reasons given for ACCC approval of Grain Express was that it is unlikely to lead to a substantial lessening of competition. It would seem that the way wheat deregulation has unfolded in WA and the difficulties experienced in managing the shipping program, a number of traders and growers may be arguing that there has been a lessening of competition.
3.5.2 WEMA and the WA Transportation Act

Throughout the review, the question of regulating grain to rail was continually raised as an option by the proponents of the GIG proposal and rail in general. Since 1989, following the McColl Royal Commission into Grain Handling, Storage and Transportation, the storage, handling and transportation of grain has been deregulated in Australia. The freedom to handle and move grain by any means is also supported in Part 9 of WEMA, where it prohibits any interference in this trade.

By contrast, there has been a view expressed to the review team that the WA Transportation Act provides government with the capacity to control how grain is transported and can therefore restrict it to rail. Our reading of Division 3, Section 37 of the Act indicates that the State does not have the capacity to restrict grain to rail, but through the issuance of permits for road movements, can effectively restrict the movement of grain by road transport through the permit process. This would seem an inefficient option to regulate grain transport to rail, and is certainly not in the spirit of WEMA. It would be unfortunate if the State felt compelled to adopt this approach, as it would likely have far wider implications for grain trading in WA. Of greater concern is the extent to which the GIG investment proponents feel they need such regulation to ensure its viability.

3.5.3 Grain Market Deregulation

The Federal Government’s decision to go down the deregulation path for wheat exports signals a period of major change in Australia’s grain industry. Recently ABB Grain confirmed that Viterra, one of Canada’s largest agribusinesses has lodged a takeover offer for ABB worth up to $1.6 billion. Viterra is a major player in Canada’s bulk handling system who has diversified into grain marketing, farm inputs retailing and food processing. This further confirms the interest being shown by international traders in the deregulated Australian grain market, which will lead to competition not only in grain marketing, but also in the respective supply chains. New entrants will seek to develop efficiencies and cost savings to strengthen their relative position in the market.

Overseas experience has shown that expensive and inefficient parts of the supply chain will be challenged and become redundant as the market seeks newer, lower cost paths to market. One example of this has been the accelerated construction of the “high throughput” elevators in Canada since 1994 and the subsequent elevator and branchline closures.

Experience in other states has also shown that storage providers are successfully differentiating themselves in the competitive storage and handling market. Recent entrants to the market have competed with traditional storage providers through offering extended hours of operation for grower deliveries, offering on-farm pickup services and competitive pricing. Some operators have also marketed their rail outloading capabilities as an efficiency benefit likely to attract lower freight costs from rail operators.

While CBH already offers many of these benefits such as rapid rail loading, new storage entrants will be looking at any means to offer a differentiated service for growers and grain buyers, to capture grain away from the traditional network. This will place enormous pressure on the previously regulated supply chain systems and make it difficult for CBH or ARG to constrain grain movements to their preferred sites and to rail. CBH and ARG may need to introduce greater differentiation in their pricing signals to attract grain to their preferred nodes or hubs.

The GIG report recognises the need to create efficient rail services, which in some instances means the closure of some branchlines, upgrading roads impacted by these changes and by investing in more efficient rail loading equipment. The assumption is however that these changes should be sufficient for grain to
continue to be attracted to these locations. The new market is unlikely to stand still and allow this to happen if the GIG model is not the most efficient and cost effective supply chain. The risk is that the market will work around these investments and leave them redundant as it establishes new supply chain linkages.

### 3.6 Conclusions

The prospect for increased grain production in WA over the next 25 years is good, although these increases will occur in the southern and western areas of the wheatbelt and will not result in greater tonnages being delivered to many of the branchlines that are the focus of the GIG analysis.

Grain growing should remain profitable for growers in the medium-high rainfall areas, especially if recent price increases are maintained.

Recent deregulation of the export wheat market and the emergence of independent traders will encourage the market to seek the least cost paths to port or to domestic customers, reflecting the change from production driven to demand driven supply chain solutions. There is therefore a high risk of system by-pass due to:

- Growers’ supply chain costs being high which will lead to growers seeking to reduce these costs where possible through the increased use of on-farm storage, direct delivery to port and pursuing other lower cost marketing activities;
- The new market structure resulting in increased shipping demand in the early part of the year and having a flow-on effect in the demand for transport resources. Surge capacity is largely being provided by additional road movements, which demonstrates the capacity for road to further supplant rail where required;
- CBH’s management of Grain Express and allocation of shipping capacity, which has been criticised by some grain growers and exporters due to the shipping delays being experienced;
- Shipping delays this year which have reportedly been a cost to exporters. Some traders and growers have been canvassing alternate storage, transport and shipping options to gain greater control over costs through avoiding parts of the CBH/ARG network.
4 Technical and Cost Assumptions

4.1 Scenario Verification

In addition to single line by line evaluations, the GIG considered four scenarios for potential groupings of line closure. The first two of these scenarios were based on previous studies.

The WA Strategic Grains Infrastructure Study (WASGIS) was undertaken in 2004 by the GIG to analyse impacts on the transport system resulting from the commercial strategies of the industry players. The study also aimed to provide some direction towards the re-negotiation of the grain freight agreement which was then due to expire. The study concluded that some degree of rail rationalisation was required to enable a viable core long term grain network to be established, recommending the closure of approximately 500km of railway.

At the same time, ARG and CBH undertook a Grain Network Review (GNR) to develop a transport network that would support CBH’s strategic receival plans. According to the GIG report, GNR reached the same conclusions as the WASGIS in that rationalisation of the rail network is required to reduce the shortfall between grain revenue and the full long term costs of track maintenance on the rail network. The GNR recommended the closure of 1000km of rail line.

The GIG’s Grain Freight Network Review subsequently assessed the surrender of approximately 650km of rail line over eight line sections.

The three scenarios are summarised in Table 7, and compared against the base case of retaining all lines.

Table 7: GIG scenarios

<table>
<thead>
<tr>
<th>Branch Line</th>
<th>WASGIS</th>
<th>GNR 1000</th>
<th>GIG</th>
<th>Base Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katanning – Nyabing</td>
<td>Close</td>
<td>Close</td>
<td>Close</td>
<td>Retain all</td>
</tr>
<tr>
<td>Tambellup – Gnowangerup</td>
<td>Close</td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Newdegate – Lake Grace</td>
<td></td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Maya – Perenjori</td>
<td>Close</td>
<td></td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Narrogin – Yearlerring</td>
<td></td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Kulin – Yillimining</td>
<td>Close</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>York – Quairiding</td>
<td>Close</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bullaring – Merredin</td>
<td>Close</td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Kondinin – Merredin</td>
<td>Close</td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Trayning – Merredin</td>
<td>Close</td>
<td>Close</td>
<td>Close</td>
<td></td>
</tr>
<tr>
<td>Amery – Kalannie &amp; Beacon</td>
<td></td>
<td>Close</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goomaling – McLevie</td>
<td>Close</td>
<td></td>
<td>Close</td>
<td></td>
</tr>
</tbody>
</table>

The results from the GIG analysis indicates that the optimal rationalisation of the branch line network would be based on Scenario 1 – the 2004 WASGIS recommendation that 500km of lines should be closed.
The WASGIS report indicated that the five branch lines identified for closure have an average resource cost over $30 per tonne higher than the network average. It also suggested that any further closures beyond these branch lines would be counterproductive, with the average network cost for all other scenarios being higher than the WASGIS scenario.

Since the GIG analysis, there have been a number of changes to the network:

- Two of the lines in the analysis, the Nyabing and Gnowangerup lines, are no longer operational.
- WNR has also indicated that investment on re-sleepering between Maya and Narngalu has now been reduced to a smaller segment of the line between Maya and Perenjori as other traffics may cover the investment on the remaining portion of the line.

Apart from these changes provided by WNR, no alternative suggestions or major alterations to the proposed network were put forward by key members of the GIG during discussions within the review consultation process.

However, it should be noted that during the final preparation of this report we have been advised that the key members consulted have now suggested that an alternative reduced network scenario may also exist based on a hub and spoke arrangement. This option has not been viewed or considered as part of this review.

4.2 Key Assumptions

4.2.1 Common Assumptions of GIG scenarios

There are a number of underlying assumptions that underpin all of the GIG scenarios assessed by the model. From our discussions with various members of the Group and our subsequent review of the model and information supplied, it appears that the most significant are around volume and modal share:

Volume

Production will meet or exceed current volumes.

Current grain export transport task has been at an average level of 10m tonnes per annum. The report recognises the growth potential and assumes that larger harvests will eventuate and the export freight task will grow up to 25mt by 2030. However, despite these forecasts the analysis has assumed a constant volume for transport at around 10mt p.a.

The volumes will remain within the CBH storage network

The GIG analysis has assumed that all current ports will continue to operate and that the relative market share between the ports will remain the same. It also assumed that all volumes will pass through the CBH storage network and that these volumes will therefore be captured to the rail network.

The ability of the networks to handle the volume

The GIG analysis was undertaken prior to deregulation of the bulk export wheat market, and was based on volumes flowing through the grain pooling system which will provide a buffer between surge volumes during harvest and export sales throughout the year.

No shift in regional production

The transport costs and associated capital costs did not reflect any potential change in volume within each region. The analysis assumed that current volumes on each rail corridor will remain.
Changes since GIG
As outlined in Section 3 of this report, there have been significant changes to the market since the GIG analysis was first undertaken. Key changes include:

1. Production forecasts included in the GIG report may be overly optimistic and the analysis of production data undertaken as part of this review suggests that production per hectare is likely to be in the vicinity of 1.43 tonnes per hectare in the North and East and 1.93 tonnes per hectare in the Central and South – substantially less than the 2.5 tonnes production per hectare assumed for all areas by the GIG.
2. Movement from a closed system to an open system with deregulation, additional marketers and traders who have the ability to bypass much of the CBH storage and handling network until they reach port.
3. Changes to the international market contributing to a demand driven rather than production driven market.
4. Compression of volume and transport requirements into a peak period for the three months Dec 2008 to Feb 2009 compared to the average over the same period for the last 2 years is placing greater demand on transport network and fleets (both road and rail).

Modal Share
Stable market dynamic
One of the most fundamental assumptions around the model and its outputs has been the assumption of a constant market dynamic between road and rail and that control of mode share will be contained within the pooling system i.e. CBH or AWB.

Retention of volume to rail
All GIG scenarios assume a constant modal share of 60% to rail with or without the capital investment program. It has been assumed that mechanisms will be introduced to ensure there will be no “leakage” to road based transport to the ports. All grain on closed lines currently moving by rail will be diverted to alternative rail storage on adjacent lines or mainlines.

System capacity available
The GIG Review assumed, under all scenarios, that both road and rail transport systems have the ability, and willingness to invest in the required fleet to cope with production volumes and the associated transport task.

Changes since GIG
Key changes to the market in the period since the GIG’s report was released include:

1. The change in market structure and deregulation has removed the ability of CBH to retain a high degree of control over future volumes on rail.
2. Without control over the volume handled between the storage network and port or domestic customer, CBH has no apparent mechanism in place to ensure there is no “leakage” from the anticipated rail mode share.
3. Volume can now bypass the system at the discretion of growers and/or traders where they perceive a least cost path does not involve CBH storage or movement by rail. This has a potential direct impact on:
   - ARG’s ability to recoup current capital investment in rolling stock
   - CBH’s ability to provide ARG with certainty around future volumes on rail which would be required to justify continued and future investment in wagons and locomotives
   - WNR’s ability to cover system operating costs and capital across volume on the network; and
   - Could limit the future system capacity available.
4.2.2 Capital
There are 5 major areas of capital investment required to move grain in Western Australia within the GIG supply chain.

- Below rail investment in track and structures, with the major component of the planned investment comprising the re-sleepering of existing lines;
- Below road investment, primarily enhancement of existing roads through widening, improving pavement strength and improvements to intersections and alignments on both state and local road networks;
- Above rail investment in rolling stock, including locomotives and wagons for the standard gauge and narrow gauge network;
- Above road investment in vehicles; and
- Investment in storage and handling assets including grain silo networks, loading and receival facilities for the transfer of grain and access to the facilities.

The GIG’s Grain Rescue Package and associated investment program does not review the need for, nor make recommendations for any investment required outside these links in the supply chain. No consideration of handling or storage requirements outside the CBH regional network, including port or farm requirements were identified in the GIG report nor are they included in this review.

4.2.3 Operating Costs
Ongoing operating costs, and particularly additional costs that must be incurred or can be avoided, are considered within the review. These costs fall into the same categories as above and include:

- Below rail operating expenditure - the changes to operating costs between retaining and closing lines have been estimated;
- Below road operating costs - these have been included as avoidable costs should the required investment in rail proceed;
- Above rail and above road operating costs, i.e. comparative costs per tonne to undertake the transport task; and
- Storage and handling associated with grain storage and loading.

The two major options; that is to close the nominated rail lines or to invest and retain rail operations on those lines, will also drive the level of environmental impact on the surrounding communities by way of noise, pollution or extra road traffic. These costs have been reflected in the GIG Review in the form of avoided externality costs in conjunction with investment to support rail.

4.3 Operating Parameters
To test the veracity of the assumptions for each road/rail scenario we have attempted to validate the more specific operating and capital costs associated with each scenario and have considered the operating assumptions that support each scenario:

Rail market overview
- The grain market in Western Australia is serviced by a single privately owned track provider and a single rail operator utilising both the standard and narrow gauge networks to service grain storage facilities on nearly 2,500km of track.
- Annual volumes of grain on rail are in the region of 6 million tonnes with roughly 80% going to export.
- The average haul on rail is approximately 284km.
Volume commitment
- ARG currently provides rail services to CBH sites across the network on an as required basis with short term scheduling of a week to ten days apparently being normal practice.
- We understand there is agreed required forward capacity under contract.
- Rates to each site are set across the network to reflect comparable road rates serving each site which results in a degree of cross subsidisation.
- There is no apparent commitment of volumes on rail for any location.

Track access
- Track access charges are negotiated between the track owner and the operator but are subject to review by the Economic Regulation Authority.

Input costs
- A dedicated fleet of locomotives and wagons currently service the grain market. The services are contracted to CBH.
- The grain rail branch lines are due for major cyclical maintenance and re-sleepering. The current state of the track has resulted in increased speed restrictions and increased cycle times. This has resulted in a reduction in monthly rail capacity and increased movements on road during the most recent harvest.

Rail capacity
- The recent export wheat deregulation has had a significant impact on the supply chain and the ability of rail to deliver on both service and capacity.
- The late harvest and front ended-shipping program have increased demand significantly early in the year with rail unable to match capacity to this spike in demand.
- Consequently support for rail later in the year could be significantly reduced.

Demand growth
- The majority of lines used by grain are dedicated for that purpose. There is no other commodity growth identified for use on these lines.
- Key growth areas on WNR’s network are the Goldfields Network (Southern Goldfields to Esperance), the Southwest Network (between Bunbury and Kwinana) and to the north, the Midwest Network (serving Geraldton). This growth is driven primarily by the minerals and coal markets.

Utilisation
- A trip time basically consists of:
  - Travel time - a function of distance and allowable speed (track condition);
  - Loading time - a function of loading method, volumes and possible dwell time; and
  - Offloading time - a function of offloading method, volumes and possible dwell time.
- Line capacity appears not to be a problem on the majority of the network apart from the Eastern Goldfields Railway (EGR) where scheduled interstate freight and passenger services take priority. This can result in significant delays during peak periods, increasing trip times and reducing the number of productive cycles.
- Imposed heat restrictions from November to February during the season peak appear to impact ARG’s train and manning schedules.
4.4 Below Rail Assumptions

4.4.1 Capital Expenditure
WNR’s proposal is to rehabilitate the grain carrying lines by installing new steel and timber sleepers.

WNR’s assumptions are:
- A 1:4 and 1:2 (majority 1:2) sleeper replacement strategy of conversion to steel sleepers
- 50% timber sleeper replacement
- Dedicated teams to carry out the work over a four year period

General Commentary
The proposed re-sleepering project was originally based on a 1 in 4 replacement of wooden sleepers with steel. Wooden sleepers have an expected life of 25 years compared to steel of between 35 and 40 years. The required investment to support the continued operation of the line was deferred prior to the development of the GIG report and is now overdue. The last significant investment in the narrow gauge branchlines was at Stage 1 of this change out program and was completed between 1996 and 2000.

WNR has now allowed for a 1 in 2 steel sleeper pattern, alternating with new timber sleepers and selected recovered timber sleepers. The original figures provided in the GIG analysis for below rail investment expenditure were based on a 10 year investment program – this has since been contracted into a four year timeframe in order to recover deferred investment over the past 4 years.

A re-sleepering program using 1 in 4 steel sleepers maintains line condition to allow the safe passage of trains under speed restriction conditions (slow speed). The proposed 1 in 2 re-sleepering program enables speed restrictions to be lifted, though not necessarily to full line speed.

It should be noted that in the absence of any other planned track improvements the majority of the rail grain network will still be restricted to 16t axle loads. Reviewing the options (and associated costs) to increase the axle load limit of the restricted lines or conversion of narrow gauge to standard gauge however would be prohibitive given the scale of the improvements required and was not a feasible option for consideration.

Capital expenditure assumption variation
In comparing the GIG estimates of avoidable capex costs (principally re-sleepering) against costs supplied by WNR, it is apparent that the GIG report significantly under-estimated the avoidable costs of line closures.

The total cost to keep all lines open was originally estimated by the GIG to be approximately $200m, based on a desktop exercise across a branch line network of 2,267km. As part of this review process, WNR has provided revised cost estimates based on an updated program of works, inclusive of salaries and expenses, though this estimate assumed a much reduced amount of track to be re-sleepered.

Reduction in track kilometres proposed for improvement
WNR has advised it has undertaken a number of site visits to assess the quality of the track on the branch line network, (though not all lines have yet been inspected) and as a result has reviewed the capital estimates for re-sleepering. In addition, WNR has indicated that some re-sleepering work originally identified in the GIG report has already been undertaken over the last 2 years between Narngulu and Mullewa (principally to support minerals traffic) and, as such, the request for capital investment proposed in the original GIG for re-sleepering of these lines is no longer required. Furthermore, the re-sleepering of some other lines estimated
by the GIG will not now be undertaken. These changes account for the reduction in WNR’s estimate of branch line track kilometres to be re-sleepered.

**Increase in unit costs**

WNR have advised that the cost per kilometre for re-sleepering has increased considerably since the original GIG estimate. A breakdown of the material prices between the original assumption and the new rates was not available, however WNR has provided the current unit costs for materials. There is a small discrepancy between the timber sleeper costs as recently provided by WNR are slightly below those listed in the Economic Regulation Authority (WA) draft report of February 2009 – *Review of WestNet Rail’s 2009 Floor and Ceiling Costs for Certain Rail Lines*, prepared by PriceWaterhouse Coopers in association with Maunsell AECOM. WNR have also assumed that it will be able to utilise second hand base plates to derive a lower cost per insertion. It may be prudent to assume new plates for 50% of the timber insertions which could also result in slightly higher capital costs for the project. This change alone could add $4.5m to the capex estimate.

**Other options and recommendations**

The difference in avoidable capex cost used in the GIG report to those indicated by WNR, suggests there is a need for further validation before rehabilitation work commences on the branch line network, specifically:

- Lines to be analysed in more detail in terms of traffic volumes and the impact rehabilitation measures will have on the total train turnaround time; and
- Lines to be thoroughly inspected and a suitable scope of work identified that satisfies the overall operational requirements (and includes other work required besides sleeper replacement).
  - For example on certain terminating lines with low traffic volumes the potential exists to reduce the level of re-sleepering with the trade-off of continued speed restrictions (e.g. York to Quairiding) without impacting overall service levels or utilisation.
  - Funds could then be diverted to the upgrade of sections having the most impact on the overall service to increase reliability/availability.

### 4.4.2 Operating Expenditure

WNR provides track access to ‘above rail’ operator ARG and third party rail operators via long term access arrangements. WNR is responsible for maintenance of track infrastructure, supply of the train control function, determination of track access fees and overall access management.

**Key assumptions:**

- No detailed breakdown of below rail opex was provided in either the GIG model or GIG report.
- SAHA estimates are based on new figures received from WNR as part of an original briefing note to Minister O’Brien (9 March 2009) and are based on maintaining the permanent way and major overhead costs that would be incurred or avoided should the grain network lines be retained or closed.

The WNR network includes over 5,000km of track comprising approximately 22% standard gauge, 72% narrow gauge and 6% dual gauge. The grain network comprises nearly half of the total track and is dominated by narrow gauge branchlines.
Operating expenditure on the network will not vary substantially with changes in tonnage – the GIG model has assumed that only limited costs are variable, with nearly all incurred regardless of volume changes on the line. Despite a potential closure all lines continue to incur an operating cost which is then reallocated to the remaining lines in service.

Over 50 million tonnes per annum are moved on WNR’s network with identified potential growth opportunities of over 40 million additional tonnes per annum. Table 8 shows the rail volumes and growth at the majority of ports.

**Table 8: Port volumes**

<table>
<thead>
<tr>
<th>Port</th>
<th>Current rail volume mtpa</th>
<th>Potential growth mtpa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwinana</td>
<td>12</td>
<td>+ 10 mtpa</td>
</tr>
<tr>
<td>Bunbury</td>
<td>10</td>
<td>+ 15 mtpa</td>
</tr>
<tr>
<td>Esperance</td>
<td>15</td>
<td>+ 15</td>
</tr>
<tr>
<td>EGR</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Geraldton</td>
<td>4</td>
<td>Not available</td>
</tr>
<tr>
<td>Albany</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Other - Leonora</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58 mtpa</strong></td>
<td><strong>40 mtpa</strong></td>
</tr>
</tbody>
</table>

Source: Babcock and Brown Presentation on WestNet Acquisition

WNR revenues are predominantly sourced from access fees. Customer contracts typically specify volume-based access charges (i.e. price) per gross tonne kilometre (gtk), enabling WNR to realise the benefit of projected volume growth (within regulatory ceilings).

Based on WNR’s forecast total revenue mix in 2006, revenue\(^2\) from grain was expected to return 25% of total access fees – based on approximately 10-12% of total volume. WNR’s 2006 revenue mix was forecast as follows:

**Table 9: WNR 2006 revenue**

<table>
<thead>
<tr>
<th>Share of WNR revenue</th>
<th>Grain</th>
<th>Iron Ore</th>
<th>Alumina and Bauxite</th>
<th>Inter-State Freighter</th>
<th>Mining Freighter</th>
<th>Other Mineral</th>
<th>Passenger and Other Access</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25%</td>
<td>21%</td>
<td>14%</td>
<td>12%</td>
<td>11%</td>
<td>14%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Babcock and Brown Presentation on WestNet Acquisition

---

1. 22 February, 2006 ASX Release: Babcock & Brown – Overview of Western Australian “Below Rail” Business
2. 22 February, 2006 ASX Release: Babcock & Brown – Overview of Western Australian “Below Rail” Business
Cost assumption variation

**Breakdown of costs**
Operating costs on a rail network generally comprise: infrastructure maintenance, track and signalling, train control, access management, and general administration. The track maintenance program is expected to remain largely constant in real terms over the life of the asset.

Operating costs can be categorized broadly into system costs (those related to the management of the network which do not change substantially with additions to or closures of parts of the network) and linear costs (variable costs that are a function of the length of track maintained, e.g. materials).

The nature of a rail network, as with any fixed network, means that it has high system (or fixed) operating costs relative to its linear (direct and marginal, or variable) operating costs. Below rail operating costs therefore do not tend to materially increase or decrease with changes in volume, though savings in variable costs can be realised with the complete closure of sections of line.

**Volume impact**
Network operating costs will not change substantially with changes in branch line mix, given the frequency of service on the branch lines is not high and therefore reductions in volume across the network will not be reflected in substantially lower operating costs for the network. Operating costs will only be reduced on the complete closure of a line or group of lines enabling the removal of costs associated with track inspections, communications and materials, etc that are specific to that line or group of lines.

Unavoidable annual opex associated with line closures within the GIG modelling is based on the difference between the calculated direct operating costs for keeping each line open and the costs for the system (using the assumption that mainline opex continues to be incurred) that would need to be reallocated to other parts of the grain line network. The fixed mainline costs are derived from three shared corridors – the Southern Cross to Kwinana line segment, the Narrogin to Avon line segment (servicing both Wagin to Albany and Kwinana) and the line between Wagin and Albany.

Despite potential changes to volume on the network that could emanate from the new structure, it is unlikely there will be much change to WNR’s annual operating expenditure. The original model has been based on the assumption that only a small number of costs are avoidable and are directly related to tonnage – this is not an unrealistic assumption. The major impact will be the ability for remaining grain volumes to absorb the higher proportion of opex should WNR pass it on through its access pricing regime.

**Reallocation of network costs**
Total unavoidable fixed mainline costs are allocated to branch lines on a line by line basis.

Lack of further information in the GIG process regarding the nature of these costs (i.e. labour or materials breakdown and whether they are costs associated with permanent way or broader operation of the network) makes it difficult to assess whether there have been significant changes to the underlying figures.

The information provided in the GIG report does not identify whether any of these costs may be avoidable in the long run or whether broader network closures would result in increases in the avoidable cost. It is also unclear how the cost allocation on mainline opex to branch lines has been made.
Threshold points for system costs
Updates provided by WNR suggest that up to $16m of opex could be avoided if all grain lines on the network were to close. The majority of these costs ($14m) are associated with maintaining the permanent way. We believe that all but the general and administration costs could be avoided on a line by line basis, with some threshold costs related to labour and equipment provision expected.

Without detailed information on current track condition, incidents and other components behind the fixed operating costs for each line, a revised estimate for operating expenditure can be only approximate at best. A high level estimate based on line closures suggests that approximately $7.5m per annum could be saved by closing the nominated lines however some costs would remain (to cover non linear expenditure items such as train control and regional offices). This estimate has been derived on the basis of branch line length given the high proportion of costs associated with permanent way maintenance which have a high linear correlation.

Other options and recommendations
The following further evaluations are suggested:
- Further details should be sought and assessed regarding total transport task on the network and whether grain traffic costs per gtk need to be borne totally by retained grain movements or whether they should also be shared by growing traffics on other routes i.e. allocation of mainline non-avoidable costs could be covered by new volume on EGR
- Retained routes should be analysed in more detail in terms of traffic volumes and the impact rehabilitation measures will have on the total train turnaround time.
- Lines be thoroughly inspected and a suitable scope of work identified that satisfies the overall operational requirements (and includes other work required besides sleeper replacement).

4.5 Below Road Assumptions

4.5.1 Capital Expenditure
Key assumptions include:
- Estimated costs for improvements to State roads (increasing road width to 7m) based on assumption of the use of multi-trailer trucks with a maximum gross mass of up to 107.5 tonnes (i.e. class 2, category 7 vehicles)
- For state roads:
  - Road widening costs per km were estimated at $190,000 for line closed (GNR 1000) and $139,000 for line open scenarios
  - The costs per intersection improvement were estimated to be in the range of $210,000 to $360,000
  - The costs of other road improvements were estimated to be in the range of $1.4m to $1.5m
- Local road improvements are based on upgrades to allow B Double/Road Train standard (i.e. gross vehicle mass of up to 87.5 tonnes)
- Estimated costs for improvements to local roads were pro-rated up to incorporate additional capital costs for the South West Region as a whole. Costs were increased by two thirds of the original wheatbelt estimates (i.e. to a new total of $250m). An additional $100m was subsequently added to this figure.
General commentary - State Roads

In conjunction with rail, the WA grain freight network utilises a State Government provided main road and road feeder network and a Local Government provided road feeder network. With rail share currently at 60%, comments from stakeholders in the road freight industry suggest that the amount of grain transported by road has increased and will continue to grow in the future. If certain rail lines are closed, the road network will play a far greater role in line haul grain movements from farm/storage sites to port.

Key variables that will impact on the scale or variation of capital expenditure on roads include:

- The extent to which the additional task exceeds the current capability of the network i.e., what expenditure would be required over and above road improvements and maintenance activities which are already needed and would occur anyway
- Unit costs for the type of work required and the number and nature of improvements required
- The types of vehicles which will be required to move the additional grain volumes and their impact on the types of road improvements needed

Capital expenditure estimates for improvements to state roads are based on the 2006 Grain Freight Study Road Impact Analysis Report (Road Impact Report) prepared by Lowes Churchill and Associates. The study considered the potential line closures under the GNR1000 scenario and determined the upgrading works that would be required to accommodate additional vehicles. According to the report, the assessment of the various road links to determine the need for upgrading and/or increased maintenance was based on a visual assessment of the road by MRWA, although it was noted that some costs were based on budgetary estimates previously prepared by MRWA.

The report assumed that the road transport task would use multi-trailer trucks with a maximum gross mass of up to 107.5 tonnes (i.e. class 2, category 7 vehicles). While this assumption recognises the fact that larger combinations would be used to replace rail on key arterial roads, it could be that certain ports such as Albany and Geraldton also receive even larger vehicle combinations (e.g. gross mass of 127.5 tonnes and greater). However, above road costs within the GIG model are predicated on the basis of B Doubles/pocket Road Trains at standard weight limits and not on these larger vehicle combinations. This would appear to be a fundamental inconsistency between estimates for above and below road costs.

A number of key issues noted in the Road Impact Report were

- It can be difficult to determine the capacity of existing road improvements from a simple visual assessment
- Under estimation of traffic volumes could result in premature pavement failure, which could increase costs. This was seen to pose a greater risk for assessment of local roads rather than state roads
- The cost differential between cost recovery for local and state roads has not been considered, on the basis that it would be accounted for in road upgrading costs. It is unclear whether the impact of concessional mass limits on road recovery costs was considered as part of the work

Capital expenditure assumption variation – State Roads

Cost estimates for road improvements under line open/closed scenarios, based on the Road Impact Report, are shown in Table 10. In overall terms, a key question relates to the extent to which these improvements would be required under the scenarios being considered. This is not possible to establish without detailed further work. Another key issue relates to the different road users (both freight and non freight) who would benefit from road improvements. For this reason, it is reasonable to argue that only a portion of road improvement costs should be attributable to the broader grain transport business case.
Independent advice from a road engineer at Maunsell AECOM suggests that the per km road improvement costs in the Road Impact Report are under estimated by at least 10-15%, which could be due to the work being three years old. The final cost estimates from the Report were increased by a factor of 21%. While no information was provided on the rationale for this, this may have been done in recognition of changes in road construction costs.

The road widening costs shown in Table 10 relate to upgrades of selective roads to a 7m seal. The road widening costs per km, based on the findings of the Road Impact Report, (post 21% adjustment) vary between $190,000 and $139,000 for line closed (GNR 1000) and line open scenarios. These figures are difficult to validate mainly because costs vary according to existing road width and condition. Information on the current widths of the roads assessed is not provided in the Road Impact Report or the GIG model. However these costs have a significant bearing on the overall below capex requirements.

The estimates of non-widening projects (which have been termed fixed improvements because the costs do not vary by distance), are also shown in Table 10. These have been broken down into two main groups
- Intersection upgrades
- ‘Other road improvements’ which include a variety of works such as road realignments and other rehabilitation works.

The cost per intersection improvement, based on the findings of the Road Impact Report (post 21% adjustment), were estimated to be in the range of $210,000 and $363,000 for the lines open and lines closed.
scenarios. It is worth noting that within the GIG model itself, it is assumed that intersection improvements would cost $300,000 per upgrade. However costs derived from this figure are not used in the GIG report. The value of other road improvements (i.e. approx $1.5 m) is significantly higher than the average cost of intersection improvements. These appear to be more substantive works, but very little information on the scope of these projects has been included in data from the Road Impact Report. These costs are therefore very difficult to validate.

To understand the effect that changes in the below road improvement costs could have on broader capex estimates, we have undertaken sensitivity analysis around budgeted and actual costs incurred by MRWA during 2007-08 for maintaining and improving the state’s road network. These costs are shown in Table 11 and provide some tangible evidence of current construction and maintenance costs within the market.

Sensitivity tests were conducted using the following values

- **Road widening costs** - the average road construction cost per lane km for rural roads ($465,814) was tested for road widening projects. While these costs are not just confined to road widening projects, it still provides a useful upper limit for testing purposes. This represented an increase in the average value of improvements in the original Road Impact Report (i.e. $139,000 - $190,000)

- **Intersection upgrades** - the average cost of intersection improvements ($167,777) was adopted as an alternate figure to the average value from the Road Impact Report (i.e. $210,000 – $363,000)

- **Other road improvements** – the average cost of improvements ($241,019) was adopted as an alternate figure to the average value from the Road Impact Report (i.e. ($1.4m - $1.5m)

<table>
<thead>
<tr>
<th>Program(s)</th>
<th>Indicator</th>
<th>2007-08 Target</th>
<th>2007-08 Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road network operations management</td>
<td>Average cost per intersection improvement</td>
<td>$249,000</td>
<td>$167,000</td>
</tr>
<tr>
<td>Road use efficiency improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road infrastructure for community areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road use safety improvements</td>
<td>Average cost of improvements undertaken</td>
<td>$145,000</td>
<td>$241,019</td>
</tr>
<tr>
<td>Road infrastructure for state development</td>
<td>Average cost of road transport construction per lane km</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freeways</td>
<td>$2,477,000</td>
<td>$1,741,984</td>
<td></td>
</tr>
<tr>
<td>Rural main roads</td>
<td>$904,000</td>
<td>$465,814</td>
<td></td>
</tr>
<tr>
<td>Rural highways</td>
<td>$1,145,000</td>
<td>$1,196,797</td>
<td></td>
</tr>
</tbody>
</table>

From the sensitivity tests it was found:

- Modifications to road widening costs have a significant impact on overall below road capex requirements. If other costs are held constant and road widening costs are increased to $465,000 per km, total below road capex costs increase to $154m for the lines open scenario, and $325m for the lines closed scenario

- Substantial reductions in the value of other road improvements only results in modest reductions in overall below road capex requirements. Again these improvements only make up a small part of the overall costs. If other costs are held constant and other road improvement costs are reduced from $1.4/$1.5m down to $241,000, total below road capex costs decrease to $43m for the lines open scenario, and $127m for the lines closed scenario

- Use of the alternate intersection upgrade cost value had virtually no impact on the overall below road capex requirements. This is because these improvements only make up a small part of the cost and the MRWA value is not significantly different from the average cost in the Road Impact Report.
If all these changes are adopted, total below road capex requirements increase from $63m/$151m to $135m/$301m for lines open and lines closed scenarios.

Table 12 below compares original below road capex estimates with the variations based on the changed inputs described above. Adoption of the MRWA costs would result in a substantial increase in capex costs for both the line closed and line open scenarios.

Table 12: Below road capex costs from Road Impact Report/GIG Report and variation estimates

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destination</th>
<th>All lines open</th>
<th>Lines closed (GNR1000)</th>
<th>All lines open</th>
<th>Lines closed (GNR1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Cross</td>
<td>Kwinana</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmon Gums</td>
<td>Esperance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wagin</td>
<td>Albany</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wagin</td>
<td>Lake Grace</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Katanning</td>
<td>Nyabing</td>
<td>1,815,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tambellup</td>
<td>Gnowangerup</td>
<td>5,445,000</td>
<td></td>
<td></td>
<td>241,019</td>
</tr>
<tr>
<td>Hyden</td>
<td>Lake Grace</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newdegate</td>
<td>Lake Grace</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perenjori</td>
<td>Narngalus (see note)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marchagee</td>
<td>Dongara</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maya</td>
<td>Perenjori</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narrogin</td>
<td>Yearlering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kulin</td>
<td>Yillimining</td>
<td>16,347,100</td>
<td>26,995,100</td>
<td>33,709,755</td>
<td>42,658,210</td>
</tr>
<tr>
<td>York</td>
<td>Quairiding</td>
<td>12,068,540</td>
<td></td>
<td></td>
<td>27,860,335</td>
</tr>
<tr>
<td>Narrogin</td>
<td>Avon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bruce Rock</td>
<td>Merredin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bullaring</td>
<td>Merredin</td>
<td>15,528,333</td>
<td>25,764,086</td>
<td>32,865,268</td>
<td>53,102,646</td>
</tr>
<tr>
<td>Kondinin</td>
<td>Merredin</td>
<td>30,608,967</td>
<td>45,251,419</td>
<td>68,885,461</td>
<td>92,990,551</td>
</tr>
<tr>
<td>Trayning</td>
<td>Merredin</td>
<td>7,668,375</td>
<td></td>
<td></td>
<td>11,808,385</td>
</tr>
<tr>
<td>Millendon</td>
<td>Watheroo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amery</td>
<td>Muckinbudin</td>
<td>5,886,650</td>
<td></td>
<td></td>
<td>9,064,740</td>
</tr>
<tr>
<td>Amery</td>
<td>Kalannie &amp; Beacon</td>
<td>13,224,090</td>
<td></td>
<td></td>
<td>37,973,325</td>
</tr>
<tr>
<td>Goomaling</td>
<td>McLevie</td>
<td>726,000</td>
<td>7,278,150</td>
<td>335,554</td>
<td>25,632,624</td>
</tr>
<tr>
<td>Toodyay</td>
<td>Miling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avon</td>
<td>Amery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NARROW GAUGE</td>
<td></td>
<td>63,210,000</td>
<td>151,396,000</td>
<td>135,796,000</td>
<td>301,332,000</td>
</tr>
<tr>
<td>TOTAL ALL</td>
<td></td>
<td>63,210,000</td>
<td>151,396,000</td>
<td>135,796,000</td>
<td>301,332,000</td>
</tr>
</tbody>
</table>
An additional $50m in expenditure on upgrading and maintenance of state roads in non-rural areas is included in Exhibit 14 of the GIG report, but the source of these costs could not be identified in the model provided. This cost applies to both the rail open and rail close scenarios. On this basis it has not been subjected to further analysis.

**General commentary - Local Roads**
Capital expenditure estimates for local roads are driven mainly by estimates derived from the 2006 Wheatbelt Region Road Evaluation Study by Parsons Brinkerhoff (PB). The study estimates that $150m in road improvement costs would be required to upgrade roads to B Double/Road Train standard. The exact vehicle configurations permissible within this category are not clear, although the analysis assumes a payload of 50 tonnes for these vehicles. On the basis of this figure, it could be assumed that improvements would accommodate pocket Road Train configurations at maximum standard weight limits (but not concessional limits, which are widely adopted by large road freight companies).

Because the study area excludes the Greater Southern Region, the PB estimates were pro-rated up to estimate additional capital costs for the South West Region as a whole. Costs were increased by two thirds of the original wheatbelt estimates (i.e. to a new total of $250m). Characteristics of roads outside the wheatbelt do not appear to have been accounted for within this estimate.

The PB estimates are based on scenarios relating to the potential implementation of the CBH centralisation strategy, the potential closure of branch lines that are restricted to 16 tonne axle loads, or a combination of the two. The relationship these scenarios have with the specific grain line closure scenarios being considered in the study cannot be clearly determined with the information provided.

An additional $100m of capital costs appears to have been added to the pro-rated wheatbelt estimate. The origin of this additional cost in the model was unclear. The overall required expenditure of $350m is the same under both scenarios of lines remaining open and lines closing.

**Capital expenditure assumption variation – Local Roads**
Several stakeholders have expressed reservations about the accuracy of estimates from this PB report. Further work is being undertaken to update the original estimates, but is not yet complete. While we have a number of concerns about the accuracy of this estimate, it has not been subjected to any further analysis on the basis that it would be required under both scenarios. For this reason we believe that it should be excluded from Capex requirements related to rail line closures.

### 4.5.2 Operating Expenditure

Key assumptions include:
- The Road Impact Report encompassed the development of a road maintenance cost model, but outputs from this have not been included in the report
- It was noted that in most cases, road maintenance costs would be reduced by road upgrades, as a result of reduced shoulder and seal edge wear for wider sealed pavements
- The Western Australian Local Government Association (WALGA) estimated that an additional cost of $10.3m would be incurred by local authorities each year for road maintenance
General commentary – State Roads and Local Roads
Road maintenance costs represent a substantial portion of total road expenditure. In WA, State Government capital expenditure on main roads exceeded $720 million\(^3\), while more than $475 million was allocated to maintaining the road network.

The work by Lowes Churchill and Associates included the development of a road maintenance cost model, but outputs from this have not been included in the GIG report. The report presents changes in unit maintenance costs after upgrading to a 7m seal (GIG Report, p13) but these are not related to the roads considered in the assessment. The report notes that in most cases, road maintenance costs would be reduced by road upgrades, as a result of reduced shoulder and seal edge wear for wider sealed pavements. The report noted that there was a lack of data available from MRWA and Local Authorities on existing road costs at the discrete level on individual road links. The assessment was therefore based on known information such as total annual maintenance costs.

While estimates of current and future road maintenance costs were not explicitly included in the report, an estimate is included in the GIG model which shows costs decreasing following upgrades.

Separate to this estimate, road maintenance cost reductions have also been included within the original source data provided from the Road Impact Report. This shows costs decreasing from a current level of $3.6m per year to $1.6m following upgrades. The model notes that further work is required on these figures, so they have been ignored in favour of the opex costs discussed previously.

General commentary – Updated costs from Western Australian Local Government Association (WALGA)
The original road improvement costs estimates from the GIG report were subsequently updated by the Western Australian Local Government Association (WALGA). In a submission to the Commonwealth in April 2009, a revised set of costs was presented for below road improvements for local roads. The total amount of funding requested from the Commonwealth for road improvements was revised upwards from $26.7m to $33m per year. This cost increase was attributed to additional local road maintenance costs, estimated at $10.6m per year. The basis for this additional cost was not made clear in the submission. This results in an increase in the total capex funding requirement over 10 years to $863m (from the original figure of $800m).

4.6 Above Ground Rail Assumptions

4.6.1 Capital Expenditure
ARG’s grain fleet operates on both the narrow and standard gauge network. Thirteen train sets are currently operational within the grain sector, 3 on the standard gauge and 10 on the narrow gauge in various configurations, but generally consisting of two locomotives and between fifty and sixty wagons.

The GIG model assumes capital expenditure will be required from 2015 onwards. The model includes other capital expenditure that was unable to be identified, however it was determined that the cost of the new locomotives amounted to around 25% of the total. Allocation of these costs by line was not clear, so SAHA were unable to break down this estimate any further.

Looking at locomotive costs alone, the GIG model appears to have underestimated the capex.

\(^3\) Main Roads Western Australia, 2008 Annual Report
4.6.2 Operating Expenditure

Key assumptions include:
• Revenues at Feb 2007
• Track access at Feb 2007
• Assumes road cost of 7.5 c per ntk delivery to rail

A brief analysis of the ARG cost data has been undertaken. The cost data was sourced from the “Above Rail Summary Data” supplied by ARG (as supplied to KPMG on 31 March 2009).
A breakdown of the costs by zone indicates the rail costs (excluding capital costs and access charges) vary in size. The Merredin zone is an outlier with a cost significantly higher than elsewhere. The reasons behind this cost differential has not been provided by either ARG or WNR.

4.7 Above Road Assumptions

4.7.1 Capital Expenditure

The Western Australian grain market is serviced by a large number of trucking organisations; however the market is dominated by a small number of key players. Truck types used are limited, with the significant majority of trips taken by semi trailers with a 56 tonne payload (although the GIG report implies 44t payload\(^4\)). Some truck operators are farmers who have bought the equipment for use on the farm to transport grain from the field to bins. Given this prior expenditure of capital for use other than long haul grain transport, it is potentially erroneous to include the entirety of this sunk cost in the above road capital expenditure evaluation.

Key assumptions include
• Model: assumes truck with 96 tonne GVM and 56 tonne payload
• Report: implied assumption of 44t payload truck
• Average loaded trip distance if branch lines close for movements from bin to port is assumed to be the same as the average trip distance from farm to silo (i.e. 25km)
• 220 days of operation per annum

The GIG model uses the rate at which vehicles will be replaced in net tonne kilometres (ntk) to estimate capital expenditure for a network line segment. It is calculated using the following formula:

\[
\text{CAPEX} = \frac{(\text{NTK}^\text{TOTAL})}{(\text{NTK}^\text{ANNUAL})} \times \text{TruckCost}
\]

\(\text{NTK}^\text{TOTAL}\) is the total ntk travelled along the line segment annually and \(\text{NTK}^\text{ANNUAL}\) is the estimated annual kilometres travelled by one truck (derived from a range of operational assumptions). The GIG model has used a depreciated replacement cost (DRC) approach to determine truck cost, assuming a replacement cost of $450,000 written down by 53% (SAHA have not been able to verify the validity of the 53% figure). The GIG model makes a number of assumptions when calculating a truck’s annual ntk. The assumptions concerning the size of the road task for the lines closed scenario are somewhat conservative and as a result SAHA believes that the vehicle capital cost is overstated. The issue with the base assumptions used by the GIG model is that it uses the estimated distance between farm and silo (25km) for all road ntks in all scenarios.
Given the much larger range of distances travelled under the lines closed scenario, both from silo to silo, and between silo and port, this is believed to be too conservative an estimate and results in a low value when the

\(^4\) GIG Report, p6
annual ntk per vehicle is calculated. This in turn results in an unduly high estimated capex. Table 13 lists the GIG model assumptions along with SAHA’s revised assumptions.

### Table 13: Above Road Assumptions

<table>
<thead>
<tr>
<th></th>
<th>GIG Model - Vehicle specifications</th>
<th>Pocket Road Train (SAHA) – Vehicle Specifications</th>
<th>Rigid + 2 Dog Combination Cat 7 Class II (SAHA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From Above Ground Road Model, Sheet Road Transport Operator</td>
<td>From SAHA Cost model</td>
<td>From SAHA Cost model</td>
</tr>
<tr>
<td>GVM</td>
<td>91.0</td>
<td>87.5</td>
<td>107.5</td>
</tr>
<tr>
<td>Payload</td>
<td>56.6</td>
<td>62</td>
<td>75</td>
</tr>
<tr>
<td>Rig Capital Cost</td>
<td>$450,000</td>
<td>$350,000</td>
<td>$325,000</td>
</tr>
<tr>
<td>Trailer Cost</td>
<td>-</td>
<td>$260,000</td>
<td>$320,000</td>
</tr>
<tr>
<td>53% written down cost (total)</td>
<td>$238,500</td>
<td>$323,300</td>
<td>$341,850</td>
</tr>
<tr>
<td>Trips per day</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Loaded trip length (km)</td>
<td>25</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Days of operation</td>
<td>220</td>
<td>220</td>
<td>220</td>
</tr>
<tr>
<td>ntk per vehicle per annum</td>
<td>1,848,000</td>
<td>3,273,600</td>
<td>3,960,000</td>
</tr>
<tr>
<td>vkt per vehicle per annum</td>
<td>66,000</td>
<td>105,600</td>
<td>105,600</td>
</tr>
</tbody>
</table>

For the lines closed scenario, capex has been increased proportionally with the additional road ntk travelled. The formula used to calculate lines closed capex is:

\[
\text{CAPEX}_{\text{LINES CLOSED}} = \text{CAPEX}_{\text{LINES OPEN}} + \text{CAPEX}^{10 \text{ year NPV of all extra trucks required for the new load}}
\]

SAHA believes the average trip distance used for the GIG analysis is underestimated for the same reason as stated in the lines open scenario. The GIG model uses annual ntk per truck based on a 25km farm to silo trip rather than the potentially longer (240km) trip from silo to port. Using this longer trip distance results in higher annual kilometres per vehicle. This suggests a higher capacity for ntk per vehicle thereby reducing the potential number of vehicles required to manage the total ntk task.

SAHA has applied its own assumptions to the new capital estimates for lines closed and GNR 1000 and the resultant capital expenditure is lower in both cases by around 13%. SAHA has increased the vehicle utilization and used the conservative truck type estimate (pocket Road Train which has a smaller payload of the two options).

As can be seen in Table 13, SAHA has provided a revised set of operational estimates, as well as two truck combinations to produce a high and low range of ntk.

Given the longer distances trucks would travel between silos and from silo to rail, we believe that a more appropriate trip length assumption for the calculation of operational task size is a 240km average trip length to port than that used in the GIG model. The increase in trip distance results in a lower number of trips per day; despite this the total kilometres travelled per day will be greater using SAHA’s estimates due to the waiting time required for loading and unloading at the end of each trip.

---

5 Note that page 12 of GIG report refers to 44t payload road vehicles.
The GIG model assumes a B-Double 56 tonne payload truck when calculating capex. However it is understood that this type of vehicle is rarely used for this traffic. As a result and given the volume of grain being carried, combined with the condition and restrictions of WA roads, SAHA believes it would be appropriate to assume two alternative truck types. First, a pocket Road Train type vehicle which has a 62 tonne concessional payload, and second the rigid truck plus 2 dog combination (category 7, class ii) which has a 75 tonne payload. Assuming the same operating hours as the original GIG estimates, the pocket Road Train will generate a 1.7 times increase in ntk per truck per annum than the GIG model. Similarly, the 75t payload vehicle will deliver twice the annual ntks that the GIG model estimate delivers.

The effects of these assumption changes deliver a capex reduction of over 20%.

### 4.7.2 Operating Expenditure

Key assumptions of the GIG report operating cost calculations include:

- Calculated cost per kilometre of $0.0627 per kilometre (based on 1.9 million ntk per vehicle per annum)
- A 7% Return on Capital
- For rail lines that close, additional ntk on road will be 25% of the original rail ntk
- Operational cost breakdowns (percentages of total) from ANZ Industry Brief, 2004

The GIG model uses the estimated annual operating hours of a vehicle to calculate operational expenditure for a particular line segment. A range of assumptions are made to estimate a standard $/ntk value (~0.062) which is then multiplied by ntk data from the GIG model for that line to obtain opex estimates for each line segment. This rate per ntk is based on the use of B Doubles along the route and does not include the stated GIG desired Return on Capital (ROC) of 7%.

A comparison was made between the range of ntk rates calculated in the SAHA cost model for selected routes and the standard rate used by the GIG model. SAHA’s rates ranged between $0.049/ntk and $0.078/ntk, with an average of $0.060/ntk. Given these similarities between SAHA rates and the GIG rates, we are confident in stating that the base GIG rates are reasonable.

However given the GIG report’s stated ROC requirement of 7%, a more appropriate $/ntk rate would include the ROC and sit closer to $0.067/ntk. The GIG report uses a rate of $0.07/ntk. The reasons behind the differing flat rate per ntk used in the model and the ROC-included rate stated in the report are not known.

Road distances from farm to bin were not included in the estimates/calculations as those costs will be retained regardless of any line closures.

GIG’s additional road costings for line closures are determined by adding 25% of the original rail ntk onto the existing road ntk total. The incremental road cost is calculated using a cost estimate for carrying the extra grain at a rate of $0.075/ntk. The rationale behind the allocation of 25% of rail ntk to road upon line closure is not clear.

---

6 As provided in Above Ground Road Model – Sd+D Road Data Sheet
4.8 Storage and Handling

Key assumptions of the GIG report estimates include:

- Investment is required in 18 rapid rail loaders to improve rail efficiency and capacity
- Improved on-site access to road and rail loading facilities on site for all scenarios
- Additional road/rail and level crossing costs of $40m (indexed by 21%) external to CBH's sites

If lines were closed, the GIG report indicates that there would be a need to convert rail load sites for road load out by removing the rail and laying bitumen for trucks. Where lines remained open, GIG estimates a capital requirement for additional ground conveyors, extended loop lines and 18 new rapid loaders.

GIG's initial capital expenditure estimate for the project covered 117 sites including 18 rapid rail loaders. A review of these current sites indicates 18 rapid rail load sites are now operational, so it is unclear as to whether additional rapid rail loader investment is required. Discussions with CBH suggest that the cost of rapid rail loaders has quadrupled since the GIG Review was completed, raising the question of whether further investment will occur and if so, how the cost will be recovered.

Capital investment estimates for the lines closed scenario appear to be approximate only with little or no detail provided on the actual improvements required on a site by site basis. The estimated cost to relocate a loader if a line was closed is approximately $1m per relocation. Breakdown of costs by site was not available.

The GIG report also includes off-site road/rail and level crossing estimates and totals the expenditure for both lines open and lines closed scenarios at $40m even though costs for each scenario are clearly different.

During the review a request of CBH for recent and future planned investment was made, however no information was provided.

4.9 Price Relativity between Road and Rail

Appendix 4 of the GIG Review details the analysis underpinning the report's road and rail pricing information. The appendix states that rail is currently pricing below cost and that current rail pricing is based on the road equivalent rate calculated on $0.07 per ntk. It should be noted that this statement is not substantiated by any supporting analysis. However, CBH have advised that the rail price is based on network pricing, not site cost pricing, and road distance from port plays a major role.

The GIG report also claims that for rail to recover total resource costs (including long term track costs) rates would need to increase on average by 95% (i.e. from the “Current Market Rate” of $14.35/t to a “Rail Viable Position - Full Resource Recovery” of $27.94/t). At a minimum, rates should increase from the current rate of $14.35/t to $21.52/t, which is the “Rail Viable Position - Current Market Rate”. This appears to be the price that would achieve “financial viability” for rail, without recovering long-term track costs.

The report argues that due to historical subsidisations and variations, the gap between road and rail prices will be greater over some routes and on these routes the rail operator will cease to offer services. As a result grain will transfer to road and in the absence of rail in the market, road operators will increase their prices. This argument appears to ignore the competitive forces already operating within the road market. Road may be the only mode operating, however competition within the road sector is intense, and arguably this competition would limit the ability of operators to increase rates.

---

7 CBH information provided to the GIG Review
To gauge the relative competitiveness of road vs rail over the network and the risk of leakage away from rail, a comparison of road and rail costs has been developed. Ten sample sites were selected and the costs have been calculated on likely current operating parameters. These in turn can be compared with the current Grain Express rates available for the 2008-09 season (as accessed from the CBH website). It should be noted that these costs are indicative only, however they clearly illustrate the risks around the current pricing model and the advantages higher mass limit road vehicles have over rail on certain routes.

From Table 14 it can be seen that SAHA’s calculations forecast lower prices for road than rail for all three different truck combinations. Road becomes more competitive as vehicle payload increases. Rail is most competitive when rail and road kilometres are approximately even, but even in this instance rail is still more expensive than road.

Table 14: Sample Road and Rail rates for origins in the central region

<table>
<thead>
<tr>
<th></th>
<th>Rail Distance (km)</th>
<th>Road Distance (km)</th>
<th>Rail (SAHA) ($/t)</th>
<th>Pocket Road Train (SAHA) ($/t)</th>
<th>Rigid + 2 Dog (SAHA) ($/t)</th>
<th>B Double + 2 Dog (SAHA) ($/t)</th>
<th>CBH Freight Rate Nov08 ($/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRUCE ROCK</td>
<td>362</td>
<td>270</td>
<td>$28</td>
<td>$18</td>
<td>$14</td>
<td>$14</td>
<td>$25</td>
</tr>
<tr>
<td>YEALERING</td>
<td>390</td>
<td>224</td>
<td>$32</td>
<td>$15</td>
<td>$12</td>
<td>$12</td>
<td>$23</td>
</tr>
<tr>
<td>KALANNIE</td>
<td>370</td>
<td>301</td>
<td>$25</td>
<td>$20</td>
<td>$16</td>
<td>$15</td>
<td>$24</td>
</tr>
<tr>
<td>NAREMBEEN</td>
<td>405</td>
<td>293</td>
<td>$29</td>
<td>$19</td>
<td>$15</td>
<td>$15</td>
<td>$26</td>
</tr>
<tr>
<td>KULIN</td>
<td>441</td>
<td>286</td>
<td>$28</td>
<td>$19</td>
<td>$15</td>
<td>$15</td>
<td>$25</td>
</tr>
<tr>
<td>TRAYNING</td>
<td>389</td>
<td>277</td>
<td>$24</td>
<td>$18</td>
<td>$15</td>
<td>$14</td>
<td>$24</td>
</tr>
<tr>
<td>BROOKTON</td>
<td>252</td>
<td>141</td>
<td>$21</td>
<td>$11</td>
<td>$9</td>
<td>$9</td>
<td>$14</td>
</tr>
<tr>
<td>YORK</td>
<td>262</td>
<td>137</td>
<td>$20</td>
<td>$11</td>
<td>$9</td>
<td>$9</td>
<td>$13</td>
</tr>
<tr>
<td>PITHARA</td>
<td>324</td>
<td>287</td>
<td>$28</td>
<td>$19</td>
<td>$15</td>
<td>$15</td>
<td>$25</td>
</tr>
</tbody>
</table>
The chart below illustrates the challenge rail will continue to face against road transport from many storage sites in the central region.

Table 15: Central region comparative transport rate per tonne to port

<table>
<thead>
<tr>
<th></th>
<th>$0/t</th>
<th>$5/t</th>
<th>$10/t</th>
<th>$15/t</th>
<th>$20/t</th>
<th>$25/t</th>
<th>$30/t</th>
<th>$35/t</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRUCE ROCK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEALERING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KALANNIE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAREMBOEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KULIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRAYNING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BROOKTON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YORK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PITHARA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In most transport markets, rail generally has a strong competitive advantage over road for the movement of bulk materials such as grain and minerals. The use of higher productivity trucks in Western Australia means that grain movements are much more contestable between road and rail. Consultation with road transport operators in Western Australia did not reveal any significant areas where road is unable to compete effectively with rail. Western Australia's use of longer and heavier vehicle combinations for moving grain is unique in Australia. Pocket Road Trains (a vehicle combination consisting of a prime mover and two semi trailers connected by converter dolly) have unrestricted access to roads outside major urban centres and to main arterial roads through urban centres. In other states such as NSW, these types of vehicles operate on a much more restricted network, meaning that B Doubles are generally the largest combination that can be used to transport grain by road.

The differences between these ‘standard low end’ configurations are significant. B Doubles have a maximum payload capacity of between 40 and 45 tonnes depending on use of concessional weight limits and other factors. The majority of pocket Road Trains in use within the Western Australian can achieve a payload of between 55 and 62 tonnes. CBH Grain Express transport costs are based on vehicles operating on concessional mass limits which are permitted for trucks that operate from sites having weighbridges. As standard practice, large transport operators contracted to CBH operate pocket Road Trains at 62 tonnes, or even larger vehicle combinations where they are permitted.

Stakeholder comments suggest that smaller transport operators (e.g. owner drivers and farmers) encounter more difficulties operating at these limits, either because they do not have the necessary equipment (e.g. tri axle dollies, lightweight trailers), or because they do not have access to weighbridges. On-board weighing equipment is not recognised in WA weights and dimensions regulations, and hence using such equipment does not enable operators to run at higher limits. However, these issues aside, it is important to note that even pocket Road Trains operated at standard weight limits (i.e. 55 tonnes) provide a significant cost advantage over vehicle combinations used in other Australian states.
Even larger combinations of vehicles are in use in other parts of the network, particularly on routes to regional ports such as Albany and Geraldton. Rigid vehicles towing two trailers or prime movers towing up to four trailers (e.g. Class 2, Category 7 to Class 2, Category 10) can achieve payloads of between 70 and 90 tonnes. Use of pocket Road Trains and these larger vehicle configurations means that truck operating costs in Western Australia are at least 30% lower compared to grain markets in other states.

The use of these larger vehicle combinations is likely to increase in coming years. Unlike most other Australian states, local governments have played an active role in lobbying MRWA to permit larger vehicle combinations on its network.

4.10 Operating Cost Sensitivities

Above road and rail operating costs can fluctuate and are sensitive to common inputs including fuel, utilisation, labour rates, operating hours, etc. We have assessed the sensitivity of above road and rail operating costs to road utilisation (number of days per annum operating), backload (vehicle utilisation on return journey) and fuel price. Table 16 and Table 17 show the results of the externality sensitivity tests.

Points of interest included:

- the significant effect of a backload on costs per tonne,
- road’s greater sensitivity to fuel prices.

**Table 16: Above road - sensitivity to key inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Base Case Assumptions</th>
<th>Sensitivity</th>
<th>Sample Rates</th>
<th>Range of Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Utilisation</td>
<td>Base Case Vehicle utilised 288 Days</td>
<td>Base Case</td>
<td>$19.50/t</td>
<td>$10.70/t</td>
</tr>
<tr>
<td></td>
<td>250 Days</td>
<td>$20.50/t</td>
<td>$11.30/t</td>
<td>$20.40/t</td>
</tr>
<tr>
<td></td>
<td>320 Days</td>
<td>$18.9/t</td>
<td>$10.30/t</td>
<td>$18.8/t</td>
</tr>
<tr>
<td>Backload</td>
<td>Base Case 50% of Utilisation on Backload</td>
<td>Base Case</td>
<td>$19.50/t</td>
<td>$10.70/t</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>$25.10/t</td>
<td>$13.30/t</td>
<td>$24.90/t</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>$14.00/t</td>
<td>$8.10/t</td>
<td>$13.90/t</td>
</tr>
<tr>
<td>Fuel Price</td>
<td>Base Case Fuel Price $0.80/l</td>
<td>Base Case</td>
<td>$19.50/t</td>
<td>$10.70/t</td>
</tr>
<tr>
<td></td>
<td>$1.00/l</td>
<td>$20.80/t</td>
<td>$11.30/t</td>
<td>$20.70/t</td>
</tr>
<tr>
<td></td>
<td>$0.60/l</td>
<td>$18.30/t</td>
<td>$10.10/t</td>
<td>$18.20/t</td>
</tr>
</tbody>
</table>

The calculation of cost per tonne for road freight is based on the amount of labour, fuel, time and other factors expended during the vehicles round trip (i.e. loading the grain at the bin, travelling to port, unloading at port, travelling back to the bin). When a vehicle is loaded on its return journey, cost for the grain transport can be reduced by up to 50%.
### Table 17: Above rail - sensitivity to key inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Base Case Assumptions</th>
<th>Sensitivity</th>
<th>Sample Rates</th>
<th>Range of Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Utilisation</td>
<td>Base Case - utilised 250 Days</td>
<td>Base Case</td>
<td>Kalannie ($/t)</td>
<td>Brookton ($/t)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 Days</td>
<td>$27.00/t</td>
<td>$22.90/t</td>
</tr>
<tr>
<td></td>
<td></td>
<td>300 Days</td>
<td>$24.00/t</td>
<td>$20.50/t</td>
</tr>
<tr>
<td>Fuel Price</td>
<td>Base Case Fuel Price $0.80/l</td>
<td>Base Case</td>
<td>$25.20/t</td>
<td>$25.70/t</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1.00/l</td>
<td>$24.70/t</td>
<td>$21.10/t</td>
</tr>
</tbody>
</table>

Sensitivity testing revealed that fuel prices have a greater effect on road costs per tonne than rail, this is because fuel makes up a larger proportion of the road operator cost base. Fuel comprises 22-26% of the total road cost, whereas for rail the fuel component is a modest 6 -10%.

### 4.11 Externalities

The assumptions underlying the WASGIS report have been examined with the intent of providing some comment on the effect that they have on the calculation of externalities. The externality costs that may be borne by the community have not been independently assessed by SAHA in this review of technical and operating costs. However a comparison has been undertaken of the underlying indices used in the WASGIS report and other sources of information.

In the WASGIS report, externality costs are quoted as:
- Road 0.522c/ntk
- Rail 0.139c/ntk

Although the report advises that these unit costs are calculated from a “Bureau of Transport and Regional Economics Report (2000) and internal DPI advice”, these documents were unobtainable during this review. Subsequently, it is not possible to establish what these externality costs represent and the time period for which these costs are representative. However, a number of published sources have been consulted in order to provide an alternative externality cost estimate.

In economic appraisal for transport projects, externality costs usually pay considerations to:
- Noise pollution;
- Air pollution (health impact from carbon monoxide, oxides of nitrogen and particulate matter);
- Water pollution (toxics on highway);
- Greenhouse gas / climate change;
- Nature and landscape (incl. loss of habitat or natural vegetation);
- Urban Separation;
- Accidents; and
- Road congestion.
The severity and associated cost for these externalities are dependent on whether the freight task is performed in urban or rural areas. Externality costs are typically lower in rural areas as they have lower population density. For bulk grain traffic movements in WA, the majority of the task is performed in rural areas.

The following externality unit cost rates for rural areas have been collated in Table 18 and Table 19:

Table 18: Rural road externality unit cost rates

<table>
<thead>
<tr>
<th>Rural Road Externality</th>
<th>Rate (cents/ntk)</th>
<th>Source</th>
<th>Comment</th>
<th>Rates (cents/ntk) 2009 $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise pollution</td>
<td>0.026</td>
<td>ATC</td>
<td>ATC rate quoted in 2005 $, assume annual inflation of 3%</td>
<td>0.0293</td>
</tr>
<tr>
<td>Air pollution</td>
<td>0.01</td>
<td>ATC</td>
<td></td>
<td>0.0113</td>
</tr>
<tr>
<td>Water pollution</td>
<td>0.06</td>
<td>ATC</td>
<td></td>
<td>0.0675</td>
</tr>
<tr>
<td>Nature and landscape</td>
<td>0.11</td>
<td>ATC</td>
<td></td>
<td>0.124</td>
</tr>
<tr>
<td>Urban Separation</td>
<td>0.00</td>
<td>ATC</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Greenhouse gas</td>
<td>0.07</td>
<td>ATC</td>
<td>ATC rate quoted in 2005 $, based on $10/t CO2 equivalent, assume $20/t CO2 equivalent in 2009 $</td>
<td>0.14</td>
</tr>
<tr>
<td>Accidents</td>
<td>0.32</td>
<td>SAHA</td>
<td>SAHA rate based on 2006 cost, assume annual inflation of 3%</td>
<td>0.350</td>
</tr>
<tr>
<td>Road Congestion</td>
<td>0.00</td>
<td>SAHA</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>0.596</td>
<td></td>
<td></td>
<td>0.722</td>
</tr>
</tbody>
</table>

Table 19: Rural rail externality unit cost rates

<table>
<thead>
<tr>
<th>Rural Rail Externality</th>
<th>Rate (cents/ntk)</th>
<th>Source</th>
<th>Comment</th>
<th>Rates (cents/ntk) 2009 $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise pollution</td>
<td>0.14</td>
<td>ATC</td>
<td>ATC 10*, urban rate quoted in 2005 $, assume annual inflation of 3% and adjusted to rural rate</td>
<td>0.158</td>
</tr>
<tr>
<td>Air pollution</td>
<td>0.33</td>
<td>ATC</td>
<td></td>
<td>0.004</td>
</tr>
<tr>
<td>Water pollution</td>
<td>0.01</td>
<td>ATC</td>
<td></td>
<td>0.007</td>
</tr>
<tr>
<td>Nature and landscape</td>
<td>0.08</td>
<td>ATC</td>
<td></td>
<td>0.038</td>
</tr>
<tr>
<td>Urban Separation</td>
<td>0.08</td>
<td>ATC</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Greenhouse gas</td>
<td>0.03</td>
<td>ATC</td>
<td>ATC rate quoted in 2005 $, based on $10/t CO2 equivalent, assume $20/t CO2 equivalent in 2009 $</td>
<td>0.06</td>
</tr>
<tr>
<td>Accidents</td>
<td>0.03</td>
<td>SAHA</td>
<td>SAHA rate based on 2006 cost, assume annual inflation of 3%</td>
<td>0.033</td>
</tr>
<tr>
<td>Road Congestion</td>
<td>0.00</td>
<td>SAHA</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>0.700</td>
<td></td>
<td></td>
<td>0.300</td>
</tr>
</tbody>
</table>

---

8 Australian Transport Council (ATC), National Guidelines for Transport System Management in Australia 3 Appraisal of Initiatives
9 SAHA analysis, used internally for Economic Appraisal
10 * ATC only provides rates for urban rail transport, a proportional approach was used based on the disparity of urban and rural road rates to determine the applicable rural rail rates, Australian Transport Council (ATC), National Guidelines for Transport System Management in Australia 3 Appraisal of Initiatives
Based on the above, it appears externality costs have been understated in the WASGIS report by a magnitude of to 38% (road) and 116% (rail). However for the purpose of comparing externality costs between the two modes (more specifically the additional externality cost incurred if rail volumes migrate to road), the c/ntk savings between rail and road only increased by 10%.

<table>
<thead>
<tr>
<th>Mode</th>
<th>WASGIS 2009 $</th>
<th>SAHA 2009 $</th>
<th>WASGIS/SAHA Variance (c/ntk)</th>
<th>WASGIS/SAHA Variance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>0.522 c/ntk</td>
<td>0.722 c/ntk</td>
<td>+0.20 c/ntk</td>
<td>+38%</td>
</tr>
<tr>
<td>Rail</td>
<td>0.139 c/ntk</td>
<td>0.300 c/ntk</td>
<td>+0.161 c/ntk</td>
<td>+116%</td>
</tr>
<tr>
<td>Rail Saving</td>
<td>0.383 c/ntk</td>
<td>0.422 c/ntk</td>
<td>+0.039 c/ntk</td>
<td>+10%</td>
</tr>
</tbody>
</table>

Taking into account the WASGIS report’s assumption that when rail is closed, the road distance is approximately 15% less than rail distance, it appears the externality cost resulting from total loss of rail service stated in the WASGIS report of $5.3m is understated by 3%.

4.12 Review of Avoidable Costs

SAHA has prepared a summary of the GIG’s estimates of avoidable capital and operating costs under the three scenarios – all lines open, partial closure of the network (GNR 1000) and closure of all dedicated grain lines on the network. Costs have been included from both the report and the model and highlight the disparities that have emerged through an extended process. Where possible, SAHA has provided a revised estimate of costs for the three scenarios. However, an inability to disaggregate some cost assumptions and limited access to updated investment plans has restricted our ability to provide a full set of updated estimates.

Details on a line by line basis for each of the major items have been prepared, but because this data is commercial-in-confidence, it has not been provided in this report.

4.13 Conclusions

Rail has difficulty competing with road on both service and price due to its lower payloads on many routes, poor track condition, deteriorating cycle times and the pressure to move greater volumes during a compressed period. Road is therefore increasingly likely to erode rail’s market share due to its greater payloads, higher average speeds, improved opportunities for backloading and greater scope for deployment outside the season. We find that road vehicle operating costs are at least 30% lower in WA compared to grain markets in other states due to the larger vehicle combinations allowed in WA.

Sensitivity testing shows that fuel prices have a greater effect on road costs per tonne than rail, as fuel makes up a larger proportion of the road operator cost base. Fuel comprises 22-26% of the total road cost, whereas for rail the fuel component is a modest 6 -10%.

These conclusions undermine some of the fundamental premises of the GIG analysis, in particular that volumes would be retained on rail with or without line closures, and CBH through its storage and handling network and supply chain coordination would be able to control and direct volume to rail to ensure any new investment would be supported.
Our review of many of the costs and nominated benefits proposed through the GIG analysis suggest that the investment required may be higher than originally nominated – particularly to complete the rail re-sleepering programme. Furthermore, the benefits of avoided capital expenditure on roads may not be realised if road attracts greater volume.
5 Conclusions

The recent deregulation of the bulk wheat export market has seen the emergence of up to 23 independent exporters who are all seeking to capture and market grain at the least cost. This new market environment has accentuated the change from being production driven to demand driven, and has already impacted the management and operation of the grain supply chain. Exporters and growers recognise that the current arrangements, born out of the previous regulated environment, are not meeting the needs of the market and that growers in particular will seek to find new, lower cost options to market.

As the supply chain refocuses towards cost and service benefits, CBH's control over the supply chain, including that being exercised through their recent Grain Express initiative will diminish. CBH will find it difficult to reposition itself in a lower cost model while it seeks to maximise grain throughput through all its upcountry and port storage assets. The opportunity for CBH to divest these assets or offer differential pricing to better utilise efficient assets is limited under its present cooperative structure.

Modelling conducted by the WA Department of Agriculture and Food has shown that grain production in Western Australia, even with the impact of climate change, shows good prospects for continued growth and profitability. While such increases will result in increased export supply and a larger export freight task, most of this production will be located closer to port, in the southern and western areas of the wheatbelt. This ease of proximity to port will result in more grain being moved off-farm, direct to port by growers' own road vehicles to capture freight savings and potentially, storage cost savings.

Growers will seek other opportunities to capture supply chain savings by holding grain in on-farm storage and seeking direct marketing options with domestic buyers or container packers, again achieving better utilisation of their own vehicles.

Our analysis shows that rail's ability to compete with road on both service and price is increasingly difficult due to lower payloads on many routes, poor track condition, deteriorating cycle times and the requirement to move greater volumes during a compressed period. WA has lower truck operating costs in the grain market than other states due to larger vehicle combinations being permitted in this state. Road haulage is also able to offer increased opportunity for backloads and a greater scope for deployment outside the harvest period. Increasingly, we see that rail's market share will diminish.

These conclusions undermine some of the fundamental premises of the GIG analysis that volumes would be retained on rail with or without line closures and that CBH, through its storage and handling network and supply chain coordination, would be able to control and direct volume to rail to ensure the investment was supported. The mechanism and role of CBH as the coordinator of the logistics chain should therefore be reviewed.

It seems apparent that rail volumes on some lines will not sustain the proposed investment, particularly in areas where road can effectively compete and a further review of additional line closures should be considered.

Our review of many of the costs and nominated benefits proposed through the GIG analysis also suggests that the investment required may be higher than originally nominated. This was found particularly in the costing of rail re-sleepering, while the benefits of avoided capital expenditure on road may not be realised if road attracts greater volume.
In view of the limitations for rail to meet current and likely future demand, further work should be undertaken to ensure there is adequate infrastructure at port(s), upcountry and within the road network for road haulage to provide the necessary surge capacity.

Finally, we do not see the proposition to regulate grain to rail by way of introducing road restrictions or higher permit costs would be effective nor acceptable to the wider grower community. Such penalties would further erode grower returns and place additional pressure on Governments for greater investment in rail infrastructure to upgrade branchlines rather than rationalise as proposed by GIG.
## Appendix A – Consultation Register

### WA Grain Freight Review Consultations

<table>
<thead>
<tr>
<th>Group</th>
<th>Organisation</th>
<th>Name</th>
<th>When</th>
</tr>
</thead>
</table>
| Grain Infrastructure Group | ARG | Ken Potts  
Group General Manager ARG Bulk West  
Eddie McLeish  
Marketing Manager Grain  
Ben Campbell  
National Manager Commercial | 12 March 2009  
24 March 2009  
Email and phone correspondence |
| | WestNet Rail | Paul Larsen  
General Manager  
Allan Rose  
Commercial Manager  
Paul Lowney  
Business Development Manager  
Adam Sidebottom  
Senior Commercial Analyst  
Nathan Speed | 12 March 2009  
24 March 2009  
Email and phone correspondence |
| | CBH | Grant Thompson  
Owen Davies  
Manager Operations - Logistics Strategy  
Michael Poole | 12 March 2009  
13 March 2009  
16 March 2009  
Email and phone correspondence |
| | AWB | Sasha Grebe  
Trade Advocacy and Government Relations Manager  
Matthew Watt  
General Manager, Rail | 20 March 2009 |
| | WA Department for Planning and Infrastructure | Mr Drew Gaynor  
Director Freight Logistics  
John Georgiades  
Freight and Logistics Advisor  
Transport Industry Policy | 12 March 2009  
13 March 2009  
25 March 2009 |
| Departments and Agencies | DAFF | Des Naughton  
Manager, Grain Industry Policy | 3 April 2009 |
| | ABARE | John Hogan  
Commodity Analyst  
Leanne Laurence  
Commodity Analyst | 3 April 2009 |
| | Wheat Exports Australia (WEA) | Peter Woods  
CEO | 7 April 2009 |
<p>| | WA Department of | Dave Morrison | 13 March 2009 |</p>
<table>
<thead>
<tr>
<th>Group</th>
<th>Organisation</th>
<th>Name</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury and Finance</td>
<td>Principal Policy Officer</td>
<td>Matt Stubbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WA Department of Agriculture and Food</td>
<td>Ian Longson</td>
<td>Director General</td>
<td>18 March 2009</td>
</tr>
<tr>
<td></td>
<td>Peter Metcalf</td>
<td>Director Grains</td>
<td>23 March 2009 3 April 2009 Email and phone correspondence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sue McCarrey</td>
<td>Exec Director, Safety &amp; Strategic Development</td>
<td>17 March 2009 Email and phone correspondence</td>
</tr>
<tr>
<td></td>
<td>Ross Hamilton</td>
<td>General Manager Network and Infrastructure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peter Klein</td>
<td>Chief Executive</td>
<td>2 April 2009 Phone correspondence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brad Williamson</td>
<td>Chief Executive</td>
<td>2 April 2009 Phone correspondence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doug Brindal</td>
<td>Manager Logistics</td>
<td>3 April 2009 Phone correspondence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Rossiter,</td>
<td>Heavy Vehicle Access Planning Manager</td>
<td>18 March 2009 25 March 2009 Email and phone correspondence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27 March 2009</td>
</tr>
<tr>
<td></td>
<td>Mike Norton</td>
<td>President</td>
<td>13 March 2009</td>
</tr>
<tr>
<td></td>
<td>John Hassal</td>
<td>VP - Transport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chris Wyhoon</td>
<td>Executive Officer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deborah Whitfield</td>
<td>Grains Executive Officer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peter Wells</td>
<td>Executive Officer</td>
<td>13 March 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mr Leon Bradley</td>
<td>Chairman (Grains)</td>
<td>13 March 2009 17 March 2009 Email and phone correspondence</td>
</tr>
<tr>
<td></td>
<td>Sheldon Mumby</td>
<td>Executive Officer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peter Flottman</td>
<td>CEO</td>
<td>24 March 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peter Reading</td>
<td>Managing Director</td>
<td>10 March 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mark Gilpin</td>
<td>Principal Rail Engineer – Perth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ken Watt</td>
<td>Principal Road Engineer - Perth</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>Australian Livestock and</td>
<td>Luke Fraser</td>
<td>13 March 2009</td>
</tr>
<tr>
<td>Group</td>
<td>Organisation</td>
<td>Name</td>
<td>When</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Transporters Association</td>
<td>Executive Director</td>
<td>Peter Clemson</td>
<td>30 March 2009</td>
</tr>
<tr>
<td></td>
<td>(National Secretariat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mack Trucks</td>
<td>Troy Asperati</td>
<td></td>
<td>30 March 2009</td>
</tr>
<tr>
<td>Muscat Trailers</td>
<td>Wishes to remain anonymous</td>
<td></td>
<td>2 April 2009</td>
</tr>
<tr>
<td>Bulk grain transport</td>
<td>Peter Parslow</td>
<td></td>
<td>27 March 2009</td>
</tr>
<tr>
<td>Central Wheatbelt</td>
<td>Owner Driver - Grain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matthews Transport</td>
<td>Neville Matthews</td>
<td></td>
<td>16 April 2009</td>
</tr>
<tr>
<td>Grain Marketers</td>
<td>Alick Osborne</td>
<td></td>
<td>3 April 2009</td>
</tr>
<tr>
<td>Cargill Australia</td>
<td>Robert Green</td>
<td></td>
<td>30 March 2009</td>
</tr>
<tr>
<td>ABB Grain</td>
<td>Mark Cooney</td>
<td></td>
<td>23 March 2009</td>
</tr>
<tr>
<td>Premium Grain Handlers (PGH)</td>
<td>John Orr</td>
<td></td>
<td>26 March 2009</td>
</tr>
<tr>
<td>Other</td>
<td>Grain Industry Association of WA</td>
<td>Tony Critch</td>
<td>18 March 2009</td>
</tr>
<tr>
<td>(GIWA)</td>
<td>Chairman</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>John Duff</td>
<td>Executive Officer</td>
<td>26 March 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Email and phone correspondence</td>
</tr>
<tr>
<td>WA Local Government Association (WALGA)</td>
<td>Bill Mitchell</td>
<td></td>
<td>17 March 2009</td>
</tr>
<tr>
<td></td>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Michelle MacKenzie</td>
<td></td>
<td>7 April 2009</td>
</tr>
<tr>
<td></td>
<td>Director Transport</td>
<td></td>
<td>Email and phone correspondence</td>
</tr>
<tr>
<td></td>
<td>Ian Duncan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix B - Farm Profitability

#### Table 1: WA North and East Wheat Belt: 1990-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>FCY ($)</th>
<th>Bus Profit</th>
<th>CrpArea</th>
<th>FrmArea</th>
<th>Crp/Frm % FCY/ha</th>
<th>Wheat ha</th>
<th>Wheat t</th>
<th>t/ha</th>
<th>Wht/Frm</th>
<th>Wht/Crp</th>
<th>Beef</th>
<th>Sheep</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>148921</td>
<td>44566</td>
<td>1102</td>
<td>5843</td>
<td>18.9</td>
<td>25.49</td>
<td>838</td>
<td>919</td>
<td>1.1</td>
<td>14.3</td>
<td>0.76</td>
<td>9</td>
</tr>
<tr>
<td>1991</td>
<td>67431</td>
<td>-35335</td>
<td>1076</td>
<td>4599</td>
<td>23.4</td>
<td>14.66</td>
<td>828</td>
<td>1058</td>
<td>1.28</td>
<td>18</td>
<td>0.77</td>
<td>2</td>
</tr>
<tr>
<td>1992</td>
<td>67477</td>
<td>-25751</td>
<td>1051</td>
<td>3820</td>
<td>27.5</td>
<td>17.66</td>
<td>776</td>
<td>848</td>
<td>1.09</td>
<td>20.3</td>
<td>0.74</td>
<td>3</td>
</tr>
<tr>
<td>1993</td>
<td>114138</td>
<td>31070</td>
<td>1229</td>
<td>4354</td>
<td>28.2</td>
<td>26.21</td>
<td>979</td>
<td>1437</td>
<td>1.47</td>
<td>22.5</td>
<td>0.8</td>
<td>4</td>
</tr>
<tr>
<td>1994</td>
<td>123669</td>
<td>13760</td>
<td>1301</td>
<td>3063</td>
<td>42.5</td>
<td>40.38</td>
<td>1007</td>
<td>1610</td>
<td>1.6</td>
<td>32.9</td>
<td>0.77</td>
<td>4</td>
</tr>
<tr>
<td>1995</td>
<td>178551</td>
<td>77772</td>
<td>1411</td>
<td>3172</td>
<td>44.5</td>
<td>56.29</td>
<td>1026</td>
<td>1407</td>
<td>1.37</td>
<td>32.3</td>
<td>0.73</td>
<td>12</td>
</tr>
<tr>
<td>1996</td>
<td>214014</td>
<td>133520</td>
<td>1363</td>
<td>5874</td>
<td>23.2</td>
<td>36.43</td>
<td>946</td>
<td>1602</td>
<td>1.69</td>
<td>16.1</td>
<td>0.69</td>
<td>8</td>
</tr>
<tr>
<td>1997</td>
<td>190367</td>
<td>75676</td>
<td>1533</td>
<td>4069</td>
<td>37.7</td>
<td>46.78</td>
<td>1079</td>
<td>1862</td>
<td>1.73</td>
<td>26.5</td>
<td>0.7</td>
<td>26</td>
</tr>
<tr>
<td>1998</td>
<td>215816</td>
<td>89368</td>
<td>1553</td>
<td>3510</td>
<td>44.2</td>
<td>61.49</td>
<td>1093</td>
<td>1845</td>
<td>1.69</td>
<td>31.1</td>
<td>0.7</td>
<td>35</td>
</tr>
<tr>
<td>1999</td>
<td>116817</td>
<td>-4795</td>
<td>1763</td>
<td>3953</td>
<td>44.6</td>
<td>29.55</td>
<td>1231</td>
<td>1989</td>
<td>1.62</td>
<td>31.1</td>
<td>0.7</td>
<td>20</td>
</tr>
<tr>
<td>2000</td>
<td>159304</td>
<td>16289</td>
<td>1665</td>
<td>3393</td>
<td>49.1</td>
<td>46.95</td>
<td>1179</td>
<td>2091</td>
<td>1.77</td>
<td>34.7</td>
<td>0.71</td>
<td>5</td>
</tr>
<tr>
<td>2001</td>
<td>89056</td>
<td>-68791</td>
<td>1678</td>
<td>3431</td>
<td>48.9</td>
<td>25.96</td>
<td>1170</td>
<td>1381</td>
<td>1.18</td>
<td>34.1</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>2002</td>
<td>144982</td>
<td>48873</td>
<td>1851</td>
<td>3756</td>
<td>49.3</td>
<td>38.6</td>
<td>1213</td>
<td>1991</td>
<td>1.64</td>
<td>32.3</td>
<td>0.66</td>
<td>18</td>
</tr>
<tr>
<td>2003</td>
<td>80507</td>
<td>-80207</td>
<td>1768</td>
<td>3837</td>
<td>46.1</td>
<td>20.98</td>
<td>1232</td>
<td>693</td>
<td>0.56</td>
<td>32.1</td>
<td>0.7</td>
<td>25</td>
</tr>
<tr>
<td>2004</td>
<td>245024</td>
<td>148805</td>
<td>1986</td>
<td>4150</td>
<td>47.9</td>
<td>59.04</td>
<td>1506</td>
<td>2869</td>
<td>1.97</td>
<td>36.3</td>
<td>0.76</td>
<td>36</td>
</tr>
<tr>
<td>2005</td>
<td>231503</td>
<td>120849</td>
<td>1904</td>
<td>3787</td>
<td>50.3</td>
<td>61.13</td>
<td>1486</td>
<td>2053</td>
<td>1.38</td>
<td>39.2</td>
<td>0.78</td>
<td>21</td>
</tr>
<tr>
<td>2006</td>
<td>74127</td>
<td>-51270</td>
<td>1962</td>
<td>4360</td>
<td>45.4</td>
<td>17</td>
<td>1481</td>
<td>2575</td>
<td>1.74</td>
<td>34</td>
<td>0.75</td>
<td>17</td>
</tr>
<tr>
<td>2007</td>
<td>122648</td>
<td>-89318</td>
<td>1696</td>
<td>6019</td>
<td>28.2</td>
<td>22.04</td>
<td>1254</td>
<td>1081</td>
<td>0.86</td>
<td>20.8</td>
<td>0.74</td>
<td>22</td>
</tr>
</tbody>
</table>

Average: 144130  1550  4166  38.9  35.92  1.41  28.26  0.73

**Growth pa:** 2.52%  3.10% -0.04%  3.31%  3.14%  0.80%  3.32% NS -1.24%

**FCY ($):** Farm Cash Income in $2007-08  
**Bus Profit ($):** Business Profit in $2006-07  
**CrpArea: Total area sown to crops (ha)  
**FrmArea: Total farm area (ha)
**Crp/Frm: Total crop area (ha)/Total farm area (ha) as a %
**FCY/ha: Farm cash income per ha
**Wheat ha: Total area sown to wheat (ha)
**Wheat t: wheat produced in tonnes
**t/ha: wheat yield in tonnes per ha
**Wht/Frm: total area sown to wheat as a percentage of total farm area
**Wht/Crp: total area sown to wheat as a percentage of total area sown to all crops
**Beef: number of beef cattle as at 30 June
**Sheep: number of sheep as at 30 June
<table>
<thead>
<tr>
<th>Year</th>
<th>FCY ($)</th>
<th>Bus Profit</th>
<th>CrpArea</th>
<th>FrmArea</th>
<th>Crp/Frm %</th>
<th>FCY/ha</th>
<th>Wht (ha)</th>
<th>Wht (t)</th>
<th>t/ha</th>
<th>Wht/Frm</th>
<th>Wht/Crp</th>
<th>Beef</th>
<th>Sheep</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>118717</td>
<td>46941</td>
<td>498</td>
<td>1847</td>
<td>27</td>
<td>64.28</td>
<td>293</td>
<td>480</td>
<td>1.64</td>
<td>0.16</td>
<td>0.59</td>
<td>74</td>
<td>4130</td>
</tr>
<tr>
<td>1991</td>
<td>62622</td>
<td>-29674</td>
<td>490</td>
<td>1756</td>
<td>27.9</td>
<td>35.66</td>
<td>299</td>
<td>484</td>
<td>1.62</td>
<td>0.28</td>
<td>0.61</td>
<td>71</td>
<td>4009</td>
</tr>
<tr>
<td>1992</td>
<td>68502</td>
<td>-12639</td>
<td>534</td>
<td>1728</td>
<td>31.4</td>
<td>39.64</td>
<td>284</td>
<td>513</td>
<td>1.8</td>
<td>0.16</td>
<td>0.52</td>
<td>58</td>
<td>3871</td>
</tr>
<tr>
<td>1993</td>
<td>70095</td>
<td>-4613</td>
<td>573</td>
<td>1729</td>
<td>33.1</td>
<td>40.54</td>
<td>329</td>
<td>599</td>
<td>1.82</td>
<td>0.19</td>
<td>0.57</td>
<td>96</td>
<td>3813</td>
</tr>
<tr>
<td>1994</td>
<td>86706</td>
<td>330</td>
<td>634</td>
<td>1747</td>
<td>36.3</td>
<td>49.63</td>
<td>339</td>
<td>698</td>
<td>2.06</td>
<td>0.19</td>
<td>0.53</td>
<td>98</td>
<td>3782</td>
</tr>
<tr>
<td>1995</td>
<td>102977</td>
<td>26162</td>
<td>643</td>
<td>1857</td>
<td>34.6</td>
<td>55.45</td>
<td>332</td>
<td>542</td>
<td>1.63</td>
<td>0.18</td>
<td>0.52</td>
<td>94</td>
<td>3651</td>
</tr>
<tr>
<td>1996</td>
<td>130640</td>
<td>78066</td>
<td>627</td>
<td>1744</td>
<td>36</td>
<td>74.91</td>
<td>333</td>
<td>700</td>
<td>2.1</td>
<td>0.19</td>
<td>0.53</td>
<td>53</td>
<td>3688</td>
</tr>
<tr>
<td>1997</td>
<td>100406</td>
<td>19511</td>
<td>793</td>
<td>1872</td>
<td>42.4</td>
<td>53.64</td>
<td>410</td>
<td>793</td>
<td>1.93</td>
<td>0.22</td>
<td>0.52</td>
<td>53</td>
<td>3379</td>
</tr>
<tr>
<td>1998</td>
<td>109556</td>
<td>33652</td>
<td>730</td>
<td>1857</td>
<td>39.3</td>
<td>59</td>
<td>350</td>
<td>728</td>
<td>2.08</td>
<td>0.19</td>
<td>0.48</td>
<td>52</td>
<td>3372</td>
</tr>
<tr>
<td>1999</td>
<td>94424</td>
<td>-5333</td>
<td>830</td>
<td>2030</td>
<td>40.9</td>
<td>46.51</td>
<td>422</td>
<td>872</td>
<td>2.07</td>
<td>0.21</td>
<td>0.51</td>
<td>114</td>
<td>3375</td>
</tr>
<tr>
<td>2000</td>
<td>81985</td>
<td>-18512</td>
<td>795</td>
<td>1966</td>
<td>40.4</td>
<td>41.7</td>
<td>431</td>
<td>849</td>
<td>1.97</td>
<td>0.22</td>
<td>0.54</td>
<td>76</td>
<td>325</td>
</tr>
<tr>
<td>2001</td>
<td>23411</td>
<td>-84202</td>
<td>848</td>
<td>2209</td>
<td>38.4</td>
<td>10.6</td>
<td>455</td>
<td>589</td>
<td>1.29</td>
<td>0.21</td>
<td>0.54</td>
<td>86</td>
<td>3023</td>
</tr>
<tr>
<td>2002</td>
<td>161766</td>
<td>73093</td>
<td>935</td>
<td>2285</td>
<td>40.9</td>
<td>70.79</td>
<td>474</td>
<td>964</td>
<td>2.03</td>
<td>0.21</td>
<td>0.51</td>
<td>93</td>
<td>3389</td>
</tr>
<tr>
<td>2003</td>
<td>136358</td>
<td>60688</td>
<td>880</td>
<td>2182</td>
<td>40.3</td>
<td>62.49</td>
<td>466</td>
<td>576</td>
<td>1.24</td>
<td>0.21</td>
<td>0.53</td>
<td>112</td>
<td>3573</td>
</tr>
<tr>
<td>2004</td>
<td>203380</td>
<td>125230</td>
<td>962</td>
<td>2865</td>
<td>33.6</td>
<td>70.99</td>
<td>520</td>
<td>1126</td>
<td>2.17</td>
<td>0.19</td>
<td>0.54</td>
<td>115</td>
<td>3818</td>
</tr>
<tr>
<td>2005</td>
<td>95463</td>
<td>14225</td>
<td>1011</td>
<td>2807</td>
<td>36</td>
<td>34</td>
<td>576</td>
<td>1064</td>
<td>1.85</td>
<td>0.21</td>
<td>0.57</td>
<td>88</td>
<td>3893</td>
</tr>
<tr>
<td>2006</td>
<td>85691</td>
<td>-21668</td>
<td>954</td>
<td>2438</td>
<td>39.1</td>
<td>35.15</td>
<td>509</td>
<td>1096</td>
<td>2.15</td>
<td>0.21</td>
<td>0.53</td>
<td>98</td>
<td>3492</td>
</tr>
<tr>
<td>2007</td>
<td>101803</td>
<td>-16715</td>
<td>929</td>
<td>2253</td>
<td>41.2</td>
<td>45.18</td>
<td>466</td>
<td>702</td>
<td>1.51</td>
<td>0.21</td>
<td>0.5</td>
<td>63</td>
<td>3402</td>
</tr>
<tr>
<td>Average</td>
<td>101917</td>
<td></td>
<td>760</td>
<td>2065</td>
<td>37.2</td>
<td>49.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth pa</td>
<td></td>
<td>3.60%</td>
<td>1.99%</td>
<td>1.74%</td>
<td>3.27%</td>
<td>0.57%</td>
<td>0.29%</td>
<td>-0.42%</td>
<td>1.20%</td>
<td>-0.63%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FCY ($): Farm Cash Income in $2007-08
Bus Profit ($): Business Profit in $2006-07
CrpArea: Total area sown to crops (ha)
FrmArea: Total farm area (ha)
Crp/Frm: Total crop area (ha)/Total farm area (ha) as a %
FCY/ha: Farm cash income per ha
Wheat ha: Total area sown to wheat (ha)
Wheat ha: Total area sown to wheat as a percentage of total area sown to crops
Wheat t/ha: wheat yield in tonnes per ha
Wht/Frm: Total area sown to wheat as a percentage of total area
Wht/Crp: total area sown to wheat as a percentage of total area sown to all crops
Beef: number of beef cattle as at 30 June
Sheep: number of sheep as at 30 June