CABINET - SUBJECTS FOR CONSIDERATION, 12 NOVEMBER 2007 11:00 AM

1 New Initiatives/Policy Matters

101 MTR07/043CS

Rail Revitalisation (Patrick Conlon)
APPROVED

(APPROVAL SUBJECT TO AMENDMENTS BY MINISTER OUTLINED IN CABINET - PAGE 11 OF THE ECONOMIC EVALUATION REPORT AMENDED:

- **5.3.2 LAST SENTENCE - "A DETAILED ASSESSMENT OF THIS IS CONTAINED..." IS AMENDED TO READ "A DETAILED ASSESSMENT OF THIS WILL BE CONTAINED..."**
- **FOOTNOTE - "SEPTEMBER 2007" REMOVED)**

Not relevant

101

CABINET COVER SHEET

1.	**TITLE:**	**RAIL REVITALISATION**
2.	**MINISTER:**	**HON PATRICK CONLON MP** **MINISTER FOR TRANSPORT**
3.	**PURPOSE:**	To seek Cabinet approval of the revised expenditure profile for the Rail Revitalisation project.
4.	**IDENTIFY THE RELEVANT GOVERNMENT POLICY AND/OR SA's STRATEGIC PLAN TARGET**	*South Australia's Strategic Plan*: • Target 1.21. Strategic Infrastructure: Maintain Adelaide's rating as the least costly place to set up and do business in Australia and continue to improve our position internationally. • Target 2.11 Greater safety at work: Achieve the nationally agreed target of 40% reduction in injury by 2012. • Target 3.5. Greenhouse gas emissions reduction: Achieve the Kyoto target by limiting the state's greenhouse gas emissions to 108% of 1990 levels during 2008-2012, as a first step towards reducing emissions by 60% (to 40% of 1990 levels) by 2050. • Target 3.6. Use of public transport: increase the use of public transport to 10% of metropolitan weekday passenger vehicle kilometres travelled by 2018. • Target 3.7. Ecological footprint: reduce South Australia's ecological footprint by 30% by 2050. *Strategic Infrastructure Plan for South Australia* Strategic Priorities: • Encourage the shift to rail transport for passenger and freight movements where justified by environmental, economic or social

imperatives.

South Australia's Greenhouse Strategy, *Tackling Climate Change 2007-2020* – Target 6.4: To shift transport towards low greenhouse emission modes

5. ICT COMPONENT

Does the submission have a material ICT Component? ☒ No

6. RESOURCES REQUIRED FOR IMPLEMENTATION

Project Management will be undertaken using a combination of existing resources within TransAdelaide and Department for Transport Energy and Infrastructure.

Subject to Cabinet approval long-lead items will be procured and tenders will be awarded for a Design and Construct contractor to complete detailed design and construction.

The project was included in the 2007/8 State Budget, the table below outlines the approved cashflow for the project.

Financial Year	Forward Estimate
2007/8	$16.6
2008/9	$44.0
2009/10	$28.5
2010/11	$32.0
Total	**$121.1**

Treasury and Finance agrees with the basis of the assessment of costs contained in this submission.

7. COMMUNITY AND ENVIRONMENTAL IMPACT

The project will have a net positive affect on the environment and community by:

- Providing the foundation for a sustainable and modern rail network
- Improved train/bus connectivity
- Encouraging passenger use with subsequent decreases in private car use

There are no regulatory, business, regional, family, community or environmental impacts resulting from

entering into the negotiation of an agreement.

Does the submission have an impact on business? ☒ Yes* ☐ No *

The Department of Trade and Economic Development agrees that there are no business compliance costs associated with this submission.

8. RISKS

The key risks for this project are:

- Inability to deliver project within anticipated timeframe due to lack of suitability skilled and available human resources
- Inability to deliver project within anticipated timeframe due to long lead times associated with supply of materials
- Extent of contamination/or inability to reach agreement on disposal method.

9. CONSULTATION

Consultation on this proposal has been undertaken with the Crown Solicitors Office, Department of Treasury and Finance and other Government Agencies for their feedback and impact statements.

10. COMMUNICATION STRATEGY

A communication plan has been developed including project website, telephone and email contact details. Media releases also will be used at appropriate times.

11. URGENCY

Normal 10 day rule.

12. RECOMMENDATIONS

It is recommended that Cabinet approve:

4.1 Revised expenditure profile in table 3.1 in paragraph 3.3.1 for the Rail Revitalisation project, resulting in a positive impact on the net lending of $5.4 million in 2007/8 and offsetting negative impacts of $5.4 million in 2010/11.

4.2 Total project expenditure of $121.1 million, comprising $107.9 million capital and $13.2 million recurrent

4.3 Approve calling of a tender for supply of sleepers (estimated value $13m) and delegate authority to enter into contract to Minister for Transport

4.4 Presenting the attached submission to the Public Works Committee.

4.5 Note that a further Cabinet Submission will be prepared seeking approval to enter into the major construction contract.

4.6 Note that the Rail Revitalisation initiative announced in the budget papers included two minor works components associated with the Adelaide to Glenelg tram line, each with a value less than $4 million and a total value of $7.3 million. These initiatives are not included in this submission, and do not require reporting to the Public Works Committee.

I declare that I have no actual or potential conflict of interest in relation to the proposals contained in this submission

HON PATRICK CONLON MP
MINISTER FOR TRANSPORT

1 November 2007

TO: THE PREMIER FOR CABINET

RE: RAIL REVITALISATION

1. PROPOSAL

1.1 To seek Cabinet approval of the revised expenditure profile for the Rail Revitalisation project.

2. BACKGROUND

2.1 In June 2007 the Government announced a $121m upgrade over four years of the State's metropolitan passenger rail track, the first key step in the revitalisation of the network.

2.2 Delivering safe and reliable services is recognised as a high priority for the travelling public, and will continue to be into the future. Today, parts of the rail track and infrastructure are reaching the end of their useful economic lives. The consequence of this in some cases, is a reduction in train speeds in affected parts of the network. This has a direct impact on train on-time running, and passenger satisfaction.

2.3 The Rail Revitalisation project includes over 65 kilometres of new track, including the construction of new base layer, drainage, long life concrete sleepers and new rail where required, significantly increasing track stability and reducing journey times. This will provide more rapid services and enhanced passenger comfort and safety. Concrete sleepers have a longer life than the existing timber and steel sleepers, resulting in deferred replacement as well as reduced ongoing operating and maintenance costs

2.4 The Rail Revitalisation project is to be delivered jointly by the Department for Transport, Energy and Infrastructure (DTEI) and TransAdelaide. Resources from both DTEI and TransAdelaide will be seconded to the project team as necessary to assist in the delivery of the project.

3. DISCUSSION

3.1 Purpose

The primary objectives of the Rail Revitalisation initiative are:

- Upgrade the track on the Noarlunga line and Belair line (part) as the first stage of the revitalisation of the rail network, providing the foundation for a reliable, regular, rapid rail service - leading to patronage increases in the medium to long term.
- Provide a platform for future upgrading of services, including making provision for potential future standardisation, increased services frequency and electrification
- Improve sub-surface conditions and provide adequate drainage to improve track life and integrity

- Provide a track structure that can allow an increase in maximum train speeds.
- Encourage increased patronage due to reduced travel and delay times and increased passenger comfort and
- Remove speed restrictions associated with track condition, thereby resulting in a more rapid, reliable service.

3.2 Scope

The project scope incorporates the following elements:

- Project management and detailed design
- Survey and geotechnical investigations
- Relocation of rail and common services to facilitate the construction of the upgraded track and associated infrastructure elements
- Track construction - concrete re-sleepering of the Noarlunga rail line between Noarlunga Centre and Adelaide, and concrete resleepering of the Belair line between Sleeps Hill Tunnel and Belair, and replacement of rail that has reached the end of its useful economic life
- Encasing road crossings in concrete
- Improvements to track drainage and formation to improve ongoing track integrity and
- Provision of alternative services.

3.3 Impacts associated with this submission are outlined in the following sections.

3.3.1. Economic, financial and budgetary implications

The Portfolio Statements in the 2007/08 Budget Papers provided a total project capital cost of $115.2m. The recurrent costs associated with the project were not explicitly defined. These are shown in Table 3.1 below.

Based on an assessment of the market and project procurement planning undertaken since the budget announcement in June, the proposed project capital cashflow projection has been revised. Table 3.1 below shows the proposed revised cashflow. There is no change in recurrent projections or the overall project cost.

The table below summarises the resulting budget impacts under the proposed revised expenditure profile:

Table 3.1 Funding Impact of the Rail Revitalisation Project – Train Project

Budget	2007/08 $M	2008/09 $M	2009/10 $M	2010/11 $M	Total $M
Recurrent:					
Current Approved	0.3	4.2	4.5	4.2	13.2
Proposed	0.3	4.2	4.5	4.2	13.2
Net Operating Impact	**0**	**0**	**0**	**0**	**0**
Capital:					
Current Approved	16.3	39.8	24.0	27.8	107.9
Proposed	10.9	39.8	24.0	33.2	107.9
Net Lending Impact	**5.4**	**0**	**0**	**-5.4**	**0**

The total project capital cost announced in the Portfolio Statement included two minor works initiatives – Tramline Rerailing and Tram Air conditioning Upgrade. These initiatives have a total value of $7.3m, accounting for the difference between the capital expenditure of $115.2m in the budget Portfolio Statement and the amount listed in the table 3.1 above of $107.9m. These initiatives do not require Cabinet approval or reporting to the Public Works Committee.

The delivery of the rail revitalisation project will avoid future cost increases in track and rollingstock maintenance and annual capital program. The installation of concrete sleepers reduces the need for minor maintenance, inspection and defect repair.

3.3.2. Required resources

Generally project management will be undertaken using a combination of existing resources within TransAdelaide and Department for Transport, Energy and Infrastructure. There will be a need to employ additional resources on fixed term contracts, i.e. Engineers, Designers, Senior Project Officers and Project Managers.

Detailed overall procurement strategies are yet to be developed. In order to enable project timeframes to be achieved, contracts for the supply of long-lead items will be established immediately.

3.3.3. South Australia's Strategic Plan

The project will contribute to meeting the South Australian Strategic Plan (SASP) target 3.6 to increase the use of public transport to 10% of metropolitan weekday passenger vehicle kilometres travelled by 2018.

The project will reduce road congestion and increase patronage of public transportation resulting in 16 million less car kilometres by 2018 and a subsequent reduction of 6,000 tonnes of greenhouse gas

emissions (based on MASTEM model). This is consistent with target 3.5 of SASP.

This work will provide the foundation of a cost effective, sustainable and modern metropolitan rail network.

3.3.4. Information and Communication Technology Requirements

This proposal does not have any ICT impacts.

3.3.5. Staffing implications

Refer 3.3.2

3.3.6. Impact on the Community and the Environment

3.3.6.1 Regulatory Impact

The construction of the works does not constitute a material change to TransAdelaide's operations of the metropolitan railway network, and does not require approval of the Administering Authority under the *Rail Safety Act 1996*.

Preliminary advice received indicates that the project will not require an environmental licence to proceed. The construction contractor will be required to verify this by seeking a formal confirmation of the above prior to the commencement of construction. TransAdelaide is not able to undertake this on behalf of the Contractor. Options for disposal and reuse of contaminated ballast materials are currently being investigated, and it is possible that some options may require a licence. These options will be fully investigated with the Environment Protection Authority, and appropriate licences will be sought if required.

3.3.6.2 Business Impact

Local contractors and suppliers will be eligible to tender for the works associated with this project with potential positive impact on these businesses and local economy.

There is likely to be some minor impacts on local small businesses through reduction in patronage due to train line closures. Businesses, residents and commuters adjacent areas impacted by temporary closures will be consulted, and kept informed of project progress and potential effects.

3.3.6.3 Environmental Impact

Noise

A key benefit in upgrading the rail track infrastructure will be the reduction in operational rail noise. Removal of rail joints and

replacement with continuously welded rail on the new concrete track will significantly reduce wheel – rail impact noise.

Construction noise will be an unavoidable issue during construction works given the proximity of the rail alignment to residential properties. All reasonable and practical noise mitigation measures will be implemented during construction. The nature of the track upgrade is such that works in any particular location along the project site will be relatively short in duration, thereby minimising disruptions to residents. All works will be planned and undertaken in accordance with the *Environment Protection (Industrial Noise) Policy 1994*, and EPA Information Sheet 424/04 – *Environmental Noise*. The community will be kept fully informed throughout the planning and implementation of the project through regular and ongoing communication.

Site Contamination Remediation

A significant volume of the ballast fines material within TransAdelaide's track infrastructure is contaminated. Removal of this material will be subject to a detailed remediation management plan to ensure that contaminated material is handled in accordance with appropriate safety requirements and that excessive dust is not generated. TransAdelaide has undertaken trials to separate contaminated fines from non-contaminated ballast thereby greatly reducing the volume of contaminated material requiring disposal to landfill. Subject to receiving EPA Environmental Authorisation to undertake this activity, a similar process will be implemented on this project.

Other Impacts

The following additional environmental impacts also will be realised:

- Encouraging passenger use with subsequent decreases in private car use and greenhouse emissions
- Use of concrete sleepers will eliminate the need to use River Red Gum sleepers, saving large quantities of trees and
- Steel sleepers and rail that cannot be reused by TransAdelaide are often made available to heritage railways or will be recycled as scrap. Wooden sleepers (non-creosote) will either be reused for landscaping purposes or recycled as mulch. Methods will be investigated for recycling\reuse of creosote treated timber sleepers (whole sleepers only).

3.3.6.4 Impact on Families and Society

The project will have a positive impact on families and society by providing improved public transport services. The community also will benefit with increased employment through the construction phase of the project.

There will be negligible impact on gender and women's issues, young people and youth issues, cultural issues, functions of family members or disadvantaged persons.

Regional Impact

No significant regional impact has been identified.

3.3.7. Risk Management Strategy

A formal risk management process will be undertaken in accordance with Australian Standards (AS4360), and the identified management strategies will be implemented throughout the project. The following table summarises the initial key project risks and strategies that will be implemented to manage them:

Table 3.3 – Preliminary Risk Strategy

Risk to achievement of initiative	Mitigation Strategy
That the project is not able to be delivered within proposed program due to: a) Lack of suitably skilled and available human resources; or b) Long lead times associated with materials supply; or	Continuing development of recruitment and retention strategies already initiated within DTEI and TransAdelaide. Implementation of flexible recruitment strategies to attract and retain high calibre staff. Ongoing development of flexible in-house placements of contract project staff. Long lead procurement items identified and purchased as soon as practicable. Sleepers purchased immediately following public Works Committee approval. 'Standard' points and crossings purchased where practicable to allow for pre-purchase and flexibility.
That the project is not able to be delivered within proposed budget due to: a) Extent of contamination and/or inability to reach agreement with EPA on suitable disposal method b) Extent of geotechnical instability	Value management techniques employed to ensure expedient expenditure of available funds. Remediation management plan developed for project in consultation with EPA, focus on waste management hierarchy principles to maximise reuse and recycle and minimise disposal Full depth geotechnical investigation to determine characteristics along both line corridors. Risk associated with geotechnical characteristics shared between Government and Private contractor. Design focus on determining greatest practicable track strength characteristics in line with established construction methodologies.
Inability to spend investing funds in years allocated	Ongoing review of cashflow projections and project program. Any changes in cashflow approved in advance by Cabinet.

3.3.8. Consultation

Consultation on this proposal has been undertaken with the Crown Solicitors Office, Department of Treasury and Finance and other Government Agencies for their feedback and impact statements.

Implementation Plan

The broad implementation program for the project is shown in Table below:

Table 3.4 – Project Program

Timing	Task
Jul 2007	Commence Planning Phase
Nov 2007	Cabinet Submission
Nov 2007	Public Works Committee
Dec 2007	Order Long Lead Items
Mar 2008	Award Major Contract
Mid 2008	Commence Construction Works
End 2008	Belair Line construction complete
End 2010 / Early 2011	Noarlunga Line construction complete

3.3.9. Communication Strategy

The Communications Plan will detail activities including consultation, media and feedback. Community engagement will be extensive during this project. Locality or topic-specific forums will be consultation opportunities for those who will be affected by construction works. Regular train commuters will be invited to give preference to alternative and post-construction services. New users will be encouraged use the more frequent and reliable train travel when services resume.

A project website, telephone information service and project newsletter will be established.

Operational and service-related communications will use the print, web and InfoLine channels of AdelaideMetro (DTEIs Public Transport Division). Construction and project related information will be disseminated through brochures, community newsletters, letterboxed flyers, print press and presentations at consumer meetings as required. The project's Community Engagement and Communications department has consulted with and will continue to work with the Strategic Communications Unit of the Department of Premier and Cabinet for relevant activities during the project.

3.3.10. Public Works Committee

Cabinet approval is sought to refer the attached report to the Public Works Committee.

3.3.11. Executive Council

The approval of His Excellency the Governor in Executive Council is not necessary.

3.3.12. **Urg**ency

A Cabinet date of Monday 5 **N**ovember 2007 is sought to enable a Public Works Committee hearing on Wednesday 14 **N**ovember 2007, to enable supply contracts to commence January 2008.

4. RECOMMENDATIONS

It is recommended that Cabinet approve:

4.1 Revised expenditure profile in table 3.1 in paragraph 3.3.1 for the Rail Revitalisation project, resulting in a positive impact on the net lending of $5.4 million in 2007/8 and offsetting negative impacts of $5.4 million in 2010/11.

4.2 **T**otal project expenditure of $121.1 million, comprising $107.9 million capital and $13.2 million recurrent

4.3. Approve calling of a tender for supply of sleepers (estimated value $13m) and delegate authority to enter into contract to Minister for **T**ransport

4.4. Presenting the attached submission to the Public Works Committee.

4.5. **N**ote that a further Cabinet **S**ubmission will be prepared seeking approval to enter into the major construction contract.

4.6. **N**ote that the Rail Revitalisation initiative announced in the budget papers included two minor works components associated with the Adelaide to Glenelg tram line, each with a value less than $4 million and a total value of $7.3 million. **T**hese initiatives are not included in this submission, and do not require reporting to the Public Works Committee.

Appd subject to amendments by Minister outlined in Cabinet.

HON PATRICK CONLON **MP**
MINISTER FOR TRANSPORT

In Cabinet

1 **N**ovember 2007

12 NOV 2007

APPROVED

PREMIER

Government of South Australia
Department for Transport,
Energy and Infrastructure

Government of South Australia
TransAdelaide

SUBMISSION TO THE

PARLIAMENTARY PUBLIC WORKS COMMITTEE

Rail Revitalisation Project

1. PROPOSAL

1.1. Introduction/Background

As part of the 2007/08 State Budget the Government announced a $121m upgrade of the State's metropolitan rail track, the first key step in the revitalisation of the network. To be undertaken over four years, this work will provide the foundation of a cost effective, sustainable and modern metropolitan rail network.

Delivering safe and reliable services is recognised as a high priority for the travelling public, and will continue to be into the future. Today, parts of the rail track and infrastructure are reaching the end of their useful economic lives. The consequence of this in some cases is a reduction in train speeds in affected parts of the network. This has a direct impact on train on-time running, and passenger satisfaction.

The Rail Revitalisation project includes the following:

- Over 65 kilometres of new track, including the construction of new base layer, drainage, long life concrete sleepers and new rail where required, significantly increasing track stability and reducing journey times. This will provide more reliable services and enhanced passenger comfort and safety. Concrete sleepers have a longer life than the existing timber and steel sleepers, resulting in deferred replacement as well as reduced ongoing operating and maintenance costs
- Replacing turnouts, switching equipment and upgrading to concrete bearers in locations with high frequency usage and where assets are approaching the end of their effective lives,
- Construction of new track crossover switches to allow for future operational flexibility.
- Upgrade of 17 road level crossings, replacing bitumen with long life concrete, thus providing a smooth ride for motorists.

The Rail Revitalisation project is to be delivered jointly by the Department for Transport, Energy and Infrastructure (DTEI) and TransAdelaide. Resources from DTEI and TransAdelaide will be seconded to the project team as necessary to assist in the delivery of the project.

1.2. Policy Framework

The Rail Revitalisation project is closely aligned with the policy objectives of the South Australian Strategic Plan. Investment in transport-related strategic infrastructure such as the Rail Revitalisation project, in a general way helps fulfil the objective of "Growing Prosperity" (Objective 1) and is a commitment to achieving sustained economic growth and raising living standards. The Rail Revitalisation project is particularly pertinent to Objective 3: "Attaining Sustainability", and will help achieve the specified target 3.6 to increase the use of public transport to 10% of metropolitan weekday passenger vehicle kilometres travelled by 2018.

South Australia's Greenhouse Strategy, "Tackling Climate Change 2007-2020", has as Objective - 6.4 - the shift in transport towards low greenhouse emission modes, that includes as priority actions, investment in fixed rail infrastructure, and improving the speed of public transport services.

The table below outlines the key links to South Australia's Strategic Plan:

South Australia's Strategic Plan Target	Contribution to Target
Reducing greenhouse emissions (T3.5)	Estimated reduction in the level of Greenhouse gas emissions of 6,000 tonnes per annum compared to the base case
Reduce ecological footprint by reducing the impact of human settlements and activities (T3.7)	Utilisation of concrete rather than River Red gum timber sleepers sourced from native forests
Strategic infrastructure development (T1.21)	Costs of standardising and upgrading the network would be significantly reduced following the proposed rail infrastructure improvements. Concrete resleepering costs will be around 20% less if carried out under this initiative than if carried out after any possible future electrification already has been undertaken
Increased use of public transport to 10% of metropolitan passenger vehicle kilometres travelled by 2018. (T3.6)	More reliable and safer services makes travel by train more appealing to the commuting public. Greater potential for increased frequency and speed in the future.
Greater safety at Work 40% reduction in injury by 2012 (T2.11).	Trackside workers are exposed to high risk of intury in the railway industry. The installation of new infrastructure will reduce significantly the maintenance requirements and therefore exposure of workers to injury.

The Strategic Infrastructure Plan for South Australia has identified as a strategic priority the need to transform Adelaide's urban passenger transport system into "a cost-effective, environmentally sound and modern metropolitan network"[1]. Rail Revitalisation will enhance the rail network and create capacity to facilitate future growth and development.

1.3. Key Objectives

The primary objectives of the Rail Revitalisation initiative are:

- Upgrade the track on the Noarlunga line and Belair line (part) as the first stage of the revitalisation of the rail network, providing the foundation for a reliable, regular, rapid rail service - leading to patronage increases in the medium to long term
- Provide a platform for future upgrading of services, including making provision for potential future standardisation, increased services frequency and electrification
- Improve sub-surface conditions and provide adequate drainage to improve track life and integrity
- Provide a track structure that can allow an increase in maximum train speeds
- Encourage increased patronage due to reduced travel and delay times and increased passenger comfort
- Remove speed restrictions associated with track condition, thereby resulting in a more rapid, reliable service

[1] Strategic Infrastructure Plan for South Australia, Page 10

1.4. Project Scope

The project scope incorporates the following elements:

- Project management and detailed design
- Survey and geotechnical investigations
- Relocation of rail and common services to facilitate the construction of the upgraded track and associated infrastructure elements
- Track construction - concrete re-sleepering of the Noarlunga rail line between Noarlunga Centre and Adelaide, and concrete re-sleepering of the Belair line between Sleeps Hill Tunnel and Belair, and replacement of rail that has reached the end of its useful economic life
- Encasing road crossings in concrete
- Improvements to track drainage and formation to ensure ongoing track integrity

1.5. Project Costs

Table 1.1 below shows the breakdown of the approved $121m approved investment and operating expenditure.

Table 1.1: Project Budget Breakdown

Item	Estimated cost ($m)
• Purchase and Install Concrete Sleepers	41.9
• Turnouts and switch upgrades	20.2
• Replacement of Ballast	4.9
• Formation Repair	4.4
• Other Project Costs	10.8
• Bus Substitute and Ballast Disposal	11.0
Sub-total	82.2
Project Management, Design and Administration	4.1
Contingencies	23.8
TOTAL (future year dollars)	**$121.1**

2. EXPECTED OUTCOMES

The expected outcomes of this project, in-line with the objectives referred to in Section 1.3 above, are:

- Provide an increase in future patronage
- Reduction in long-term future investment of around $2 million per annum which would otherwise be required to maintain the rail infrastructure to an adequate and safe technical standard
- Avoided further bids for recurrent infrastructure maintenance, rollingstock maintenance and fuel cost increases averaging $1.3 million per annum over the next 25 years.
- Substantially extend rail infrastructure life due to concrete resleepering
- Reduced road congestion by 2018 as a result of the 16 million less car kilometres
- Increased road safety – less fatalities and serious injuries – as a result of 16 million less car kilometres
- A reduced ecological footprint with a substantial reduction in reliance on River Red gum timber for sleepers and a reduction of 6,000 Tonnes of greenhouse gas emissions due to the extent of the shift in transport usage from cars to rail

3. SITE OWNERSHIP AND ACCESS DETAILS

At present, the railway corridor is owned by TransAdelaide. All Rail Revitalisation works will be constructed within the boundaries of the existing railway corridor. A map of the corridors is attached at Appendix A.

As at 1 January 2008, ownership of the majority of TransAdelaide assets will transfer to the Department for Transport, Energy and Infrastructure. This will have no material impact on the delivery of this project. All land ownership and development processes will be unaffected.

Access to the corridor via non-public routes may be required at some locations throughout the project. Appropriate consultation with the relevant land owners will be undertaken during project planning to determine appropriate access arrangements.

4. DETAILS OF PROPOSED WORKS

4.1. General Overview

Delivering safe and reliable services for the travelling public is recognised as a high priority for the travelling public, and will continue to be into the future. Improvements in track structure provide the foundation for the provision of safe, reliable services. The Rail Revitalisation project will bring the track on the Noarlunga and Belair lines to a high level of integrity.

The scope of the Rail Revitalisation project is to replace over 65 kilometres of track, including the construction of new base layer, drainage, long life concrete sleepers and new rail where required to significantly increase track stability and reduce journey times. This will provide more rapid and reliable services and enhanced passenger comfort and safety. Concrete sleepers have a much longer life than the existing timber and steel sleepers, resulting in deferred replacement as well as reduced ongoing operating and maintenance costs.

Turnouts are to be replaced, including switching equipment and upgrading to concrete bearers in locations with high frequency usage. Seventeen road level crossings are to be upgraded with concrete replacing bitumen.

4.2. Rail Track Upgrading

The major focus of the rail track upgrading is the concrete re-sleepering of the Noarlunga Line between Adelaide Yard limit and Noarlunga Centre, and the Belair Line between Sleeps Hill Tunnel and Belair Station.

Rail has a significantly longer life expectancy than sleepers, and the majority of rail on the track has a considerable remaining life expectancy. Rail that is approaching the end of its useful life will be replaced.

4.3. Track formation and Drainage Upgrade

The condition of track base layer and drainage are critical to the ongoing life expectancy of the track. Track base layer and drainage will be improved in conjunction with the resleepering, providing the foundation for extended track life and reduced maintenance costs.

4.4. Rail Turnouts and Junctions

Rail turnouts and junctions permit the crossing over of trains from one track to another. Key junctions, turnouts and switching equipment will be upgrade, including upgrading to concrete bearers, in locations with high frequency usage and where assets are approaching the end of their effective lives. Installation of new turnouts will provide significant continued flexibility and facilitate more rapid, reliable rail services. It also will facilitate more efficient ongoing trackwork saving time and money in the future.

4.5. Crossings – Level

Road level crossings will be removed and re-laid with new sleepers and formation then encased in concrete. Encasing road level crossings in concrete provides a much longer life than bitumen and a smoother, safer transition for road vehicles using the level crossing.

4.6. Bridge Upgrades

A number of small open deck bridges (where rail lines cross over waterways and culverts) on the network that have reached the end of their useful economic life are to be re-constructed as closed deck. Closed deck bridges are more stable and safer from both an environmental and a rail safety perspective.

4.7. Co-ordination with other Capital Works

There are significant synergies to be gained from the integrated management of the Rail Revitalisation project and existing capital upgrade program across the network. TransAdelaide and DTEI have commenced planning processes to ensure that maximum advantage is gained from any planned network or road closures necessitated by the project, and that overall the impacts on the travelling public are reduced from levels that would have been generated through disparate management of the programs.

4.8. Replacement Public Transport Services During Construction

The re-sleepering works that comprise the majority of works to be undertaken as part of this project will necessitate closures of sections of the Belair and Noarlunga Lines. Alternative options for the replacement services will be generated following consultation with the travelling public. Options that provide the most efficient and cost effective replacement service providing the highest practicable level of service with minimum disruption will be implemented, in line with logistical and budget constraints.

It is in the best interest of the project to minimise disruptions to passengers and the general travelling public and significant resources will be dedicated to the service planning for closures. This will involve significant and ongoing consultation with stakeholder groups.

The planning, consultation and communication processes supporting service and road closures will form a key element of the collaborative planning and design team's input to project planning.

5. FINANCIAL INFORMATION

5.1. Total Project Allocation

The rail revitalisation project was included in the 2007/8 State Budget – Table 5.1 below outlines the approved cash flow for the works:

Table 5.1 Forward Estimates 2007/08 to 2010/11

Financial Year	Capital	Recurrent	TOTAL
2007/08	16.3	0.3	16.6
2008/09	39.8	4.2	44.0
2009/10	24.0	4.5	28.5
2010/11	27.8	4.2	32.0
TOTAL	**107.9**	**13.2**	**121.1**

Based on an assessment of the market and project procurement planning undertaken since the budget announcement in June, the proposed project capital cashflow projection has been revised. Table 5.2 below shows the proposed revised cashflow. This was approved by Cabinet in November 2007. There is no change in recurrent projections or the overall project cost.

Table 5.2 Proposed Revised Project Cashflow

Financial Year	Capital	Recurrent	TOTAL
2007/08	10.9	0.3	11.2
2008/09	39.8	4.2	44.0
2009/10	24.0	4.5	28.5
2010/11	33.2	4.2	37.4
TOTAL	**107.9**	**13.2**	**121.1**

Table 5.3 Project Budget Breakdown

Item	Estimated cost ($m)
• Purchase and Install Concrete Sleepers	41.9
• Turnouts and switch upgrades	20.2
• Replacement of Ballast	4.9
• Formation Repair	4.4
• Other Project Costs	10.8
• Bus Substitute and Ballast Disposal	11.0
Sub-total	82.2
Project Management, Design and Administration	4.1
Contingencies	23.8
TOTAL (future year dollars)	**$121.1**

5.2. Capital Costs

The majority of works undertaken under the project are classified as capital works and therefore are funded by capital expenditure.

Funding is provided from within the Rail Revitalisation budget as appears in the Department of Treasury and Finance Forward Estimates.

5.3. Recurrent and Operating Costs

Some activities undertaken as part of the delivery of the Rail Revitalisation project are classified as non-capital costs and are to be funded as recurrent costs. The major works to be funded as recurrent costs are the provision of bus-substitute services and the cost of recycling of ballast materials.

As recurrent expenditure costs, these costs were not explicitly defined in the Budget papers.

The delivery of the rail revitalisation project will avoid future cost increases in track and rollingstock maintenance and annual capital program. The installation of concrete sleepers reduces the need for minor maintenance, inspection and defect repair.

TransAdelaide's railcar maintenance is undertaken through a contract with a service provider. During the delivery of this contract service track condition has been identified as a contributor to higher than anticipated vehicle maintenance costs.

The effect of the timber sleepered track with its temporary speed restrictions and rough riding conditions also has created additional fuel costs.

5.4. Income

Non-commercial public transport initiatives are generally unable to provide an attractive financial rate of return as the benefits arising are not able to be financed through increased fees and charges to the public. Rather benefits are seen through economic, social and environmental outcomes though there would be expected growth in income through increased patronage in the medium term.

6. ECONOMIC ASSESSMENT

The economic assessment equating to the Net Present Value of benefits to approximately $61 million and a benefit cost ratio of 1.8. The detailed economic assessment is contained in Appendix B.

7. PROJECT PROCUREMENT

7.1. Long Lead Time Materials Procurement

Purchase of long lead time items is a significant program risk associated with the timely and effective delivery of rail infrastructure projects. Key elements of infrastructure and associated lead times are listed in table 7.1 below. The long lead times associated with the delivery of these items necessitates purchase early in the project lifecycle. For this reason, contracts for the purchase of these materials are, as proposed in this case, generally let outside the main construction contract.

The significant value of the long lead time items necessitates robust governance and statutory approvals process, including the approval of the State Supply Board and Public Works Committee consideration prior to commencement of purchase of long lead time materials. For this reason, this submission has been prepared early in the project lifecycle. This is necessary to facilitate commencement of on-site works in mid 2008.

Table 7.1 Long Lead Items

Long Lead Item	Estimated Lead Time
Sleepers	Up to six months
Rail	Four months
Points and Crossings	6 – 12 months
Signalling Equipment	6 months

7.2. Major Works (Planning, Design and Construction)

In the current market it is recognised that the most effective method of delivery of large and complex infrastructure projects is through a collaborative contracting approach. There are numerous models currently in use, including a number in South Australian Government sector, and a procurement strategy currently is being developed to identify and implement the most effective contracting model for this project.

It is expected that a project team will be formed comprising planning, design and construction resources from private industry, along with Government resources, to guide the project from commencement to completion.

Non-government Agency services will be procured through the private sector by a competitive tender process. DTEI's contract management procedures will be followed.

The design and construction works associated with the project will be managed using current best practice in accordance with State Government guidelines.

7.3. Preliminary Planning and Design Contractors and Consultants

Given the timeframes associated with the formation of an effective collaborative team, and the need to procure specialist technical expertise from time to time outside the team, a number of additional consultants and contractors will be engaged throughout the project to undertake specific tasks. While it is not possible at this early phase of the project to identify the specifics of these engagements, Table 7.2 below identified the likely areas where additional advice will be sought, and the estimated fees associated with this input. All fees are estimates.

Table 7.2 Projected Consultant / Contractor Input

Role	Est. Total Fee ($'000)	% Overall Costs
Preliminary Planning & Design	$0.15m	<1%
Geotechnical and Environmental Investigation	$0.5m	<1%
Workshop Facilitation	$0.05m	<1%
Community Engagement Consultant	$0.05m	<1%
Project Management	$0.6m	<1%
Field Survey	$0.8m	<1%
Procurement Advice	$0.1m	<1%
	Approximate Total	2.5%

8. PROJECT PROGRAM

The broad implementation program for the project is shown in Table 8.1 below:

Table 8.1 – Project Program

Timing	Task
Jul 2007	Commence Planning Phase
Nov 2007	Cabinet Submission
Nov 2007	Public Works Committee
Dec 2007	Order Long Lead Items
Mar 2008	Award Major Contract
Mid 2008	Commence Construction Works
End 2008	Belair Line construction complete
End 2010 / Early 2011	Noarlunga Line construction complete

9. PROJECT MANAGEMENT

9.1. Project Team and Governance

It is planned that the project will be jointly delivered by the Office of Major Projects, DTEI and TransAdelaide, with the Executive Director OMPI and TransAdelaide General Manager jointly sharing the project Sponsor role.

Based on a collaborative contracting model as outlined in 7.2 above, the project team will comprise government and private sector personnel. The Government element of the joint team will be comprised of DTEI and TransAdelaide personnel, and will second resources from the Department for Transport, Energy and Infrastructure as required. The joint team will be headed by the Project Director, who is accountable for the delivery of all project activities. Client Representatives have been appointed from within DTEI and TransAdelaide, to coordinate, along with the Project Director, the interface between the project team, TransAdelaide and DTEI. This interface is a critical element for success of the project.

Additional Government resources will be seconded or employed under fixed term contracts as required. As this is primarily a rail project, significant level of technical input will be required from TransAdelaide.

The private industry element of the project team will be procured through a collaborative contracting model. Procurement strategies are currently being developed and evaluated to determine the most effective methodology to deliver this project. It is most likely that a contractor consortium will be sought to deliver the planning and design and construction elements of the project. This approach has worked successfully on other recent South Australian and Australian major works contracts. It is anticipated that a contract partner will be engaged in the first half of 2008 for initial design development, with the aim of commencing construction work on the Belair line in mid 2008.

The project is to be delivered utilising the best practice systems employed by DTEI, including procedures for project management, estimating and contract management.

9.2. Delivery Method

9.2.1. Delivery Team and Procurement

Refer 9.1 and 7 above.

9.2.2. Construction Methodology

There are numerous options and permutations thereof that could be utilised to deliver the works under the project. Selection of the appropriate methodology will occur during the planning and design phase for each element of the works, and will be based upon an analysis of the following site-specific criteria:

- Site Access and proximity to storage locations
- Geotechnical conditions
- Existing track condition
- Drainage structures
- Proximity to cuttings / embankments
- Gradient
- Track working closure methodology and operational flexibility (eg: night and/or weekendworks; full track closure; Single Line Working)
- Excavation and sleeper laying methodology (mechanical track machines; track removal, excavation and construction of new formation)
- Stabilisation requirements
- Options for replacement services
- Arterial and local road crossing closure options

Based on the significant variation in these criteria along the geographic spread of the lines, there are likely to be a number of varied construction methodologies employed in the delivery of the works.

9.2.3. Key Issues

Ballast Recycling and Disposal

There are a number of options for the recycling and disposal of ballast. DTEI and TransAdelaide are currently in discussion with the Environment Protection Authority (EPA) regarding options for the treatment and reuse of ballast based on approaches developed jointly by the EPA and TransAdelaide over recent years. A successful trial to screen and reuse ballast has been undertaken on a re-sleepering project on the Belair line previously, and current discussions centre around the extension of this trial approach for the duration of this project. This has the potential to significantly reduce the total waste going to landfill and reuse of existing ballast. The issues surrounding the method for recycling will be the locations where the screening is to occur, and transport to and from those sites. Once in principle agreement has been reached with the EPA on this issue further logistics planning will be undertaken. Refer also 13.2 and 13.3 below.

Line, Road and Crossing Closures

As noted in 4.8 above, the delivery of a project of this scale necessitates rolling closures of the affected lines throughout the duration of the project. The works across the level crossings associated with each line will necessitate their closure (with the exception of those already encased in concrete) for a limited duration during the works. The resulting impacts on the travelling public arising from partial closure of train lines and closure of level crossings is a significant management issue for the project. This issue will be planned by the joint project team in full consultation with the travelling public, inclusive of pedestrians, road users and TransAdelaide customers, Transport Services Division of DTEI, local councils and other relevant stakeholders. Consultation and planning regarding line and road closures will commence in late 2007 / early 2008.

Coordination with Capital Works

Refer 4.7 above.

Replacement Services

Refer 4.8 above.

9.3. Risk Management

A formal risk management process will be undertaken in accordance with Australian Standards (AS4360). The following table summarises the initial key project risks and strategies that will be implemented to manage them:

Table 9.1 – Preliminary Risk Strategy

Risk to achievement of initiative	**Mitigation Strategy**
That the project is not able to be delivered within proposed program due to: a) Lack of suitably skilled and available human resources; or b) Long lead times associated with materials supply; or	Continuing development of recruitment and retention strategies already initiated within DTEI and TransAdelaide. Implementation of flexible recruitment strategies to attract and retain high calibre staff. Ongoing development of flexible in-house placements of contract project staff. Long lead procurement items identified and purchased as soon as practicable. Sleepers purchased immediately following public Works Committee approval. 'Standard' points and crossings purchased where practicable to allow for pre-purchase and flexibility.
That the project is not able to be delivered within proposed budget due to: a) Extent of contamination and/or inability to reach agreement with EPA on suitable disposal method b) Extent of geotechnical instability	Value management techniques employed to ensure expedient expenditure of available funds. Remediation management plan developed for project in consultation with EPA, focus on waste management hierarchy principles to maximise reuse and recycle and minimise disposal Full depth geotechnical investigation to determine characteristics along both line corridors. Risk associated with geotechnical characteristics shared between Government and Private contractor. Design focus on determining greatest practicable track strength characteristics in line with established construction methodologies.
Inability to spend investing funds in years allocated	Ongoing review of cashflow projections and project program. Any changes in cashflow approved in advance by Cabinet.

10. ECOLOGICALLY SUSTAINABLE DEVELOPMENT STRATEGIES

The Sustainability Management Plan was developed in consultation with the Office of Sustainability and Climate Change, and is attached at Appendix C to this document. This document will be refined throughout the project process.

11. HERITAGE STATUS

The following Local and State Listed heritage items have been identified within the project area:

- Belair Railway Station and Signal Box
- Blackwood Railway Station
- Shepherds Hill Road Railway Tunnel, Eden Hills
- Sleeps Hill Railway Tunnel, Watiparinga Reserve, Eden Hills

Management measures to minimise potential impact to these heritage items, including vibration monitoring, will be undertaken during construction activities.

The heritage listing of the Belair Railway Station includes the rail track infrastructure, and development approval with be sought following a site-specific application under Section 49 of the Development Act 1993, prior to any the works commencing at that site.

12. ABORIGINAL HERITAGE AND NATIVE TITLE

The Department for Aboriginal Affairs and Reconciliation will be contacted to determine whether there are any records on the Register of Aboriginal Sites and Objects within the locality of the project sites. An Aboriginal Cultural Heritage Survey for the project sites will not be required as works on the project site will occur within the existing track infrastructure which has been extensively disturbed in the past and comprises primarily imported fill material.

It has been determined that Native Title has been extinguished over rail reserve due to public infrastructure. This will be confirmed with the Crown Solicitor's Office.

13. ENVIRONMENTAL IMPACT

13.1. Operational and Construction Noise

Existing Noise Profile

Noise from trains using the existing shared corridor on the Belair Line can currently be heard by adjacent residents. Residents currently are exposed to trains accelerating, decelerating and wheel squeal as the trains traverse the tight radius bends that exist unavoidably along the length of the line from Sleeps Hill Tunnel to Belair. Residents along the Noarlunga Line are exposed to noise associated with the acceleration and deceleration of trains, however wheel noise is not a significant issue as freight trains do not run along the line, and due also to the significantly greater curve radii.

Reduction in Operational Noise

A key benefit in upgrading the rail track infrastructure will be the reduction in operational rail noise. Removal of rail joints and replacement with continuously welded rail on the new concrete track will significantly reduce wheel – rail impact noise.

Construction Noise

Construction noise will be an unavoidable issue during construction works given the proximity of the rail alignment to residential properties. All reasonable and practical noise mitigation measures will be implemented during construction. The nature of the track upgrade is such that works in any particular location along the project site will be relatively short in duration, thereby minimising disruptions to residents.

All works will be planned and undertaken in accordance with the Environment Protection (Industrial Noise) Policy 1994, and EPA Information Sheet 424/04 – Environmental Noise. It is likely that due to the nature of the works, some night works will be necessary. All night works will be undertaken in accordance with the principles of DTEI Draft Operational Instruction 21.7 – Infrastructure Works at Night, as endorsed in principle by the EPA.

All works undertaken directly by TransAdelaide will need to comply with the requirements of its licence conditions, which states:

> *The licensee must not cause or permit excessive noise, as prescribed in the Environment Protection (Industrial Noise) Policy 1994, to be emitted from any machine or tool used during the normal maintenance of the railway system between the hours of 8:00pm on any night until 8:00am the following morning unless emergency or exceptional circumstances occur where work must be carried out to open the track for the safe passage of railway traffic.*
>
> *NOTE: Thereafter higher levels of noise may be emitted provided that machines or tools are fitted with manufacturer-specified noise attenuation equipment and are used in the least noisy manner.*

All works undertaken by Contractors will be required to conform to the requirements of TransAdelaide's Environmental Licence.

Notwithstanding the requirement to work under the conditions thereof, Contractors are not able to operate under authority of TransAdelaide's Licence, and will be responsible for obtaining all necessary licences and/or authorisations for activities prior to the commencement of works.

The community will be kept fully informed throughout the planning and implementation of the project through regular and ongoing communication.

13.2. Site Contamination Remediation

A significant volume of ballast fines material within TransAdelaide track infrastructure is contaminated. The main source of this contamination is from the historical application of arsenic based weedicides along the track. Other sources of contamination include hydrocarbon contamination from grease and oil spills and the use of contaminated fill materials (for example combustion wastes from steam locomotives) during original construction of the railway.

Removal of the material will be subject to a detailed remediation management plan to ensure that contaminated material is handled in accordance with appropriate safety requirements and that excessive dust is not generated. TransAdelaide have undertaken trials to separate contaminated fines from non-contaminated ballast thereby greatly reducing the volume of contaminated material requiring disposal to landfill. Subject to receiving EPA Environmental Authorisation to undertake this activity, a similar process will be implemented on this project.

13.3. Waste Minimisation

The track upgrade has the potential to generate significant volumes of waste materials through waste streams associated with ballast, sleepers, rail and contaminated fill materials. The project team will adopt the principles of the waste management hierarchy as outlined in the Zero Waste SA Act, 2004 – a widely accepted guide for prioritising waste management practices with the objective to obtain the most favourable environmental outcome. Where possible these materials will be either be reused as part of the project or recycled elsewhere. Steel sleepers and rail that cannot be reused by TransAdelaide are often made available to heritage railways or will be recycled as scrap. Wooden sleepers (non-creosote) will either be reused for landscaping purposes or recycled as mulch. Methods will be investigated for recycling\reuse of creosote treated timber sleepers (whole sleepers only).

The contamination management process will generate two waste streams comprising cleaned ballast and contaminated fines material. The project team currently is investigating options to separately reuse these two waste streams. All recycling and reuse of material will be undertaken in accordance with the Environmental Protection Act, 1993 and DTEI Operational Instruction 21.6 - Recycled Fill Materials for Transport Infrastructure.

14. CONSULTATION AND APPROVALS

14.1. Community Engagement and Communication

Extensive community engagement will occur during the project. Particular attention will be paid to communicating the Contractor's construction methodology and details of alternative transport services when there is a need to close any of the existing rail services, or road level crossings to facilitate construction activities.

Stakeholders will be provided with the opportunity to provide input into proposed construction methodologies, including provision of alternate service delivery, throughout the planning phase of the project.

A community consultative committee is to be established for the project, comprising representatives of the travelling public, local residents, TransAdelaide, the Department for Transport, Energy and Infrastructure and Local Councils. The group will meet regularly throughout the planning and design and construction phases of the project.

A project website, 1300 telephone number and regular community newsletters are to be utilised to be utilised to inform the local community on the project's progress. Members of the public will be provided with contact details for the project to allow them to provide feedback at any time.

A draft communications management plan for the project has been developed, and is attached at Appendix E.

14.2. Consultation with other Stakeholders

Consultation with Other State and Federal Government Agencies

There has been ongoing consultation for a number of years with Government Agencies regarding the benefits of this initiative, as one of the platforms for achieving the South Australian Strategic Plan targets 3.5 and 3.6. The anticipated impacts of an improved public transport system on the business of other Government agencies are considered to be very positive.

The following agencies have been consulted since the announcement of this initiative in June 2007:

- Department of Premier and Cabinet
- Department of Water, Land and Biodiversity Conservation
- Department for Transport, Energy and Infrastructure
- Department of Trade and Economic Development
- Department for Families and Communities
- Office of Chief Information Officer
- Department of Environment and Heritage
- Environment Protection Authority
- Sustainability and Climate Change Division of the Department of the Premier and Cabinet
- Office of Youth
- Service Authorities
- Australian Rail Track Corporation

Consultation with Other Stakeholders

Although consultation has not yet been extended beyond State and Federal Government Agencies, Local Councils will have a significant interest in improved public transport services and facilities, and are expected to be keenly interested in participating in the project.

The project site passes through the following Council areas. All will be extensively consulted with prior and during the project:

- City of Adelaide
- City of West Torrens
- City of Mitcham
- City of Onkaparinga
- City of Marion
- City of Unley
- City of Holdfast Bay

Developers are expected to show a keen interest in any commercial opportunities, particularly Transit Orientated Developments, that may arise adjacent to the redeveloped train networks.

14.3. Non-Cabinet Approvals

As listed at 11 above, with the exception of works within the Heritage Area at the Belair Railway Station the Rail Revitalisation project does not constitute development under the definitions established by the Development Act 1993.

In accordance with the requirements of Section 49 of the Development Act and associated Regulations, a site-specific development application will be prepared for the works through the Belair Station Heritage Area.

The Public Works Committee (PWC) reporting is required to allow the order of long-lead time items and the potential engagement of an Early Contractor Involvement (ECI) contractor should that procurement strategy be adopted. This is a critical element in the project milestone timeline.

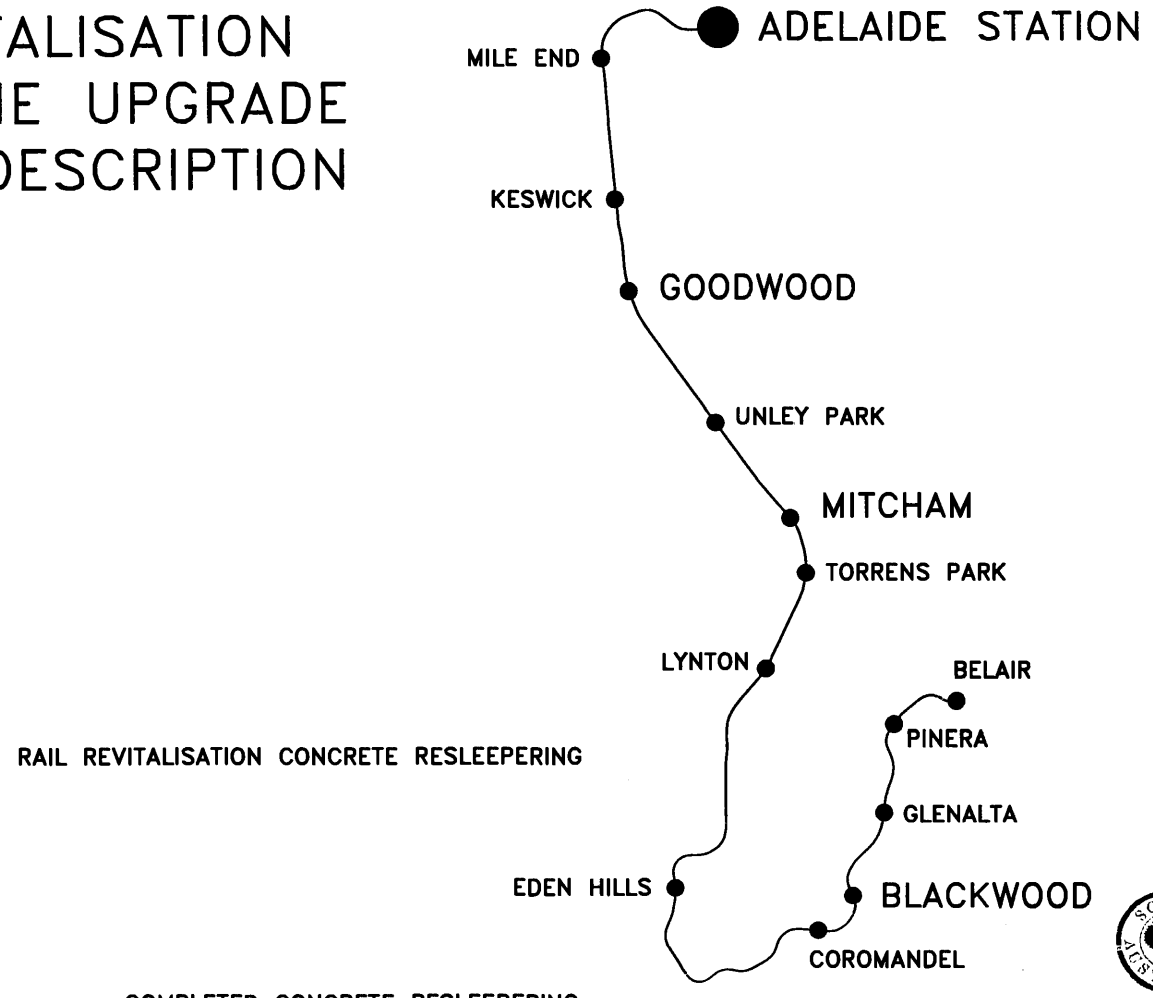
15. CABINET APPROVAL

Following assurance and advice from the Department of Treasury and Finance, the Crown Solicitor and the Office of Sustainability with respect to legal, financial, procedural and sustainability issues, Cabinet approved this work on 5 November 2007.

APPENDIX A

Site Plans

RAIL REVITALISATION
BELAIR LINE UPGRADE
PROJECT DESCRIPTION



Government of South Australia
Department for Transport,
Energy and Infrastructure

Government of South Australia
TransAdelaide

TURNOUTS REFURBISHED / REPLACED AT ALL JUNCTIONS AND CROSSOVERS

ADELAIDE YARD TO GOODWOOD

ADELAIDE YARD LIMITS

ADELAIDE STATION

MILE END

KESWICK

GOODWOOD

CLARENCE PARK

EMERSON

EDWARDSTOWN

GOODWOOD TO BRIGHTON

WOODLANDS PARK

ASCOT PARK

MARION

OAKLANDS

HOVE

WARRADALE

BRIGHTON

SEACLIFF

MARINO

MARINO ROCKS

HALLETT COVE

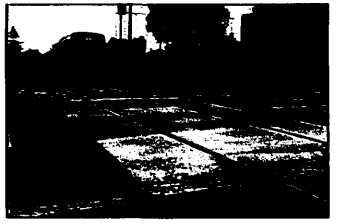
BRIGHTON TO NOARLUNGA

HALLETT COVE BEACH

LONSDALE

CHRISTIE DOWNS

NOARLUNGA CENTRE



ALL LEVEL CROSSINGS UPGRADED

BALLAST RECLAIMATION

ALL TRACK UPGRADED TO CONCRETE SLEEPERS

FORMATION UPGRADING

Government of South Australia
Department for Transport, Energy and Infrastructure

Government of South Australia
TransAdelaide

RAIL REVITALISATION
NOARLUNGA LINE UPGRADE
PROJECT DESCRIPTION

APPENDIX B

Economic Assessment

1. CONTENTS

Note: This report supports the submission to the Parliamentary Public Works Committee report on the Rail Revitalisation project and should be read in conjunction with it.

2. OPTIONS

This report addresses the economic appraisal of the Rail Revitalisation project. The preferred option of a four year project on the Noarlunga Centre and part of the Belair lines, results in a current best estimate of Benefit Cost Ratio of around 1.8. Sensitivity testing suggests the Benefit Cost Ratio could be as low as 1.2 and as high as 2.8 under certain assumptions.

The 110 km long TransAdelaide rail network provides public transport services to 68 stations, links at 12 stations with bus services, and with 11 million passengers boarding the trains every year and an estimated 450,000 passenger km each weekday, delivering 36% of the public transport task for Adelaide as well as carrying nearly 1 million tonnes of freight from the mid north to Adelaide.

This is an economic assessment of the proposal by TransAdelaide and the Department for Transport, Energy and Infrastructure to undertake a significant infrastructure reconstruction of the rail network to transform the network from a high maintenance, high risk and deteriorating system, to one which meets contemporary expectations of reliability and efficiency.

This economic assessment has been produced in accordance with the National Guidelines for Transport System Management in Australia, Volume 4, Urban Transport that have been developed for the Australian Transport Council, which are also in accordance with the Department of Treasury and Finance guidelines.

The base case is to continue managing the rail lines as the current mix of timber and steel sleepered track, repairing defects as they arise and maintaining safety by the imposition of temporary speed restrictions. There are three project cases considered in this analysis for differing levels of investment and consequential differing benefits.

The preferred project is to complete the initiative over a four year period. At the end of the four year period over 67 km of the rail lines between Adelaide and Noarlunga Centre, and parts of the Belair line will:-

- Have a life of 60 years compared to the current replacement cycle of 20 to 30 years;
- Will have reduced recurrent maintenance costs;
- Will allow the removal of localised speed restrictions on these lines;
- Will provide a track structure that can allow an increase in train speeds from 90 km/hr to 110 km/hr;
- Prepares the track for future higher frequency and faster trains, electrification and gauge standardisation if the government determines that these are priorities;
- Provide a safer track structure for train crew and passengers.

The are two other alternative options that are considered in this investigation, a do minimum strategy which addresses immediate safety concerns with the track, but essentially retains the current maintenance philosophy, and an upgrade over a 25 Year period, that results in a higher level of expenditure due to ongoing maintenance needs and inefficiencies resulting from small contracts.

The differences between the base and three project cases are detailed in the following table.

Asset	Base case (Do Nothing)	Do Minimum	Upgrade the rail lines over a 25 Year period (Alternative)	Funded Project Case (Preferred)
Investment Funding in addition to current annual program		$30 million	$140 million	$108 million
Timing	Ongoing annual program	Immediate 3 year program with ongoing annual program.	25 years	4 years (2007-08 to 2010-11)
Train Performance	Train transit times will continue to increase as temporary speed restrictions are imposed to ensure safety. By 2018 these are expected to reach 25% of current travel times	On the Noarlunga Centre line train transit times will continue to increase as temporary speed restrictions are imposed to ensure safety. By 2018 these are expected to reach 25% of current travel times On the Belair line train transit times will improve by 5% at the completion of the project in 4 years	Train transit times will stay the same as today and improve by 5% at the completion of the project in 25 years	Train transit times will improve by 5% at the completion of the project in 4 years
Sleeper replacement Sleeps Hill Tunnel to Belair	Replace defective steel sleepers on an as required basis to meet safety and performance obligations. These sleepers will have an effective life of 40 years	Replace 8 km of steel sleepers on the Belair line between Sleeps Hill Tunnel and Belair These sleepers will have an effective life of 60 years	Replace 8 km of steel sleepers on the Belair line between Sleeps Hill Tunnel and Belair These sleepers will have an effective life of 60 years	Replace 8 km of steel sleepers on the Belair line between Sleeps Hill Tunnel and Belair These sleepers will have an effective life of 60 years
Sleeper replacement Adelaide to Noarlunga Centre	Replace life expired red gum timber sleepers and defective steel sleepers on an as required basis to meet safety and performance obligations. These sleepers will have an effective life of 20 years	Replace life expired red gum timber sleepers and effective steel sleepers on an as required basis to meet safety and performance obligations s between Adelaide and Noarlunga Centre. These sleepers will have an effective life of 20 years	Replace 60 track km of timber and steel sleepers with gauge convertible concrete sleepers on the Noarlunga Centre corridor. These sleepers will have an effective life of 60 years	Replace 60 track km of timber and steel sleepers with gauge convertible concrete sleepers on the Noarlunga Centre corridor These sleepers will have an effective life of 60 years
Sleeper replacement Outer Harbor line	No replacement as sleepers are gauge convertible concrete	No replacement as sleepers are gauge convertible concrete	No replacement as sleepers are gauge convertible concrete	No replacement as sleepers are gauge convertible concrete
Ballast	Clean or replace fouled ballast at selected locations on an as needs basis	Clean or replace fouled ballast at selected locations on an as needs basis	Clean or replace fouled ballast at selected locations	Clean or replace fouled ballast at selected locations

Asset	Base case (Do Nothing)	Do Minimum	Upgrade the rail lines over a 25 Year period (Alternative)	Funded Project Case (Preferred)
Formation	Repair formation and install capping layer where required	Repair formation and install capping layer where required	Repair formation and install capping layer where required	Repair formation and install capping layer where required
Rail	Replace rail only when defects reach a level where replacement is economically justified.	Replace rail only when defects reach a level where replacement is economically justified	Weld exiting mechanical joints to form continuously welded rail, repair misaligned rail welds which cause very high impact loads and grind rail surface. Replace selected sections of rail where it is uneconomic to undertake the work described above.	Weld exiting mechanical joints to form continuously welded rail, repair misaligned rail welds which cause very high impact loads and grind rail surface Replace selected sections of rail where it is uneconomic to undertake the work described above.
Level Crossings and Pedestrian Crossings	Reconstruct and upgrade level crossings on an as needs basis.	Reconstruct and upgrade level crossings on an as needs basis.	Reconstruct all level crossings where concrete sleepers have not been previously installed.	Reconstruct all level crossings where concrete sleepers have not been previously installed.
Turnouts	Replace 2 per year over a 20 year period		Install additional turnouts to allow flexibility in train running Replace all existing turnouts with new	Install additional turnouts to allow flexibility in train running Replace all existing turnouts with new
Signalling system	Maintain signalling system	Maintain signalling system	Maintain signalling system with minor alterations to optimise train operating performance.	Maintain signalling system with minor alterations to optimise train operating performance

3. BENEFIT COST ANALYSIS SUMMARY

Table 3 presents the Benefit Cost Analysis results using best estimate parameter values. Figure 1 summarises diagrammatically the benefit components across options.

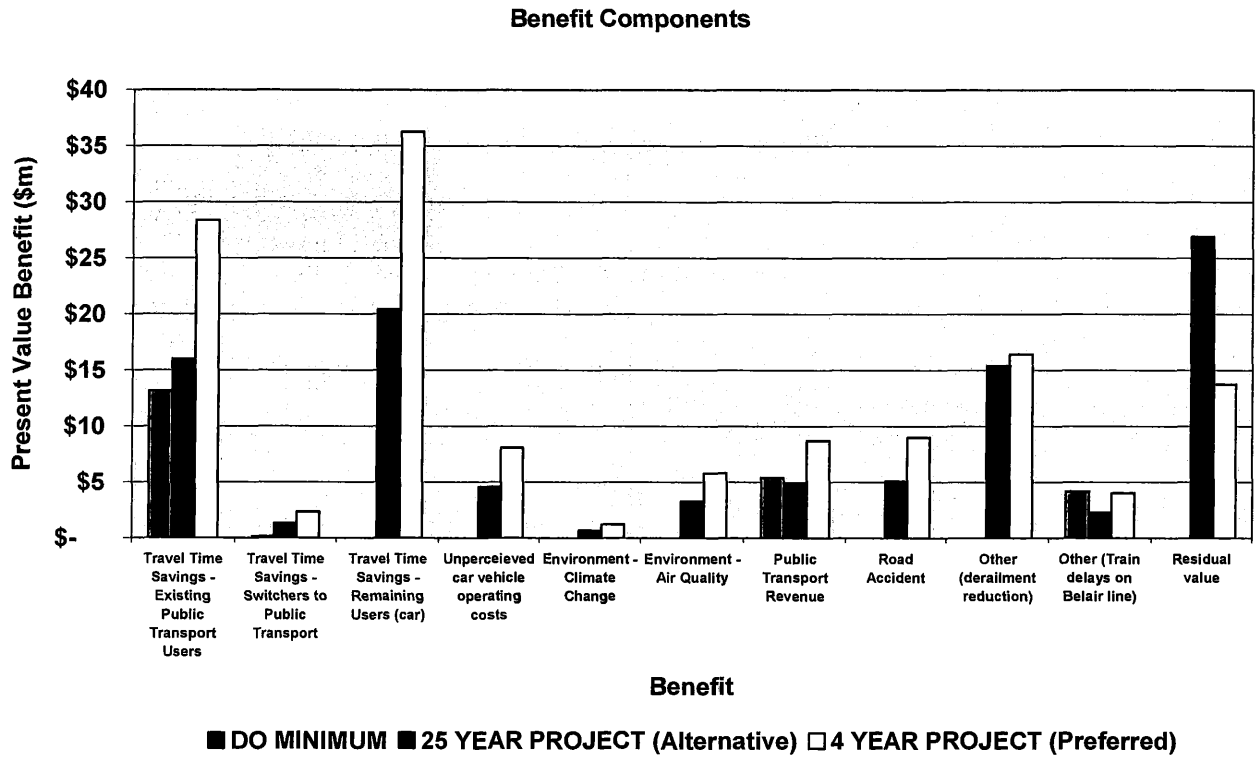
Appendices A to E outline key assumptions underlying the analysis and key aspects of the methodology.

Table 3: Benefit Cost Analysis Results Summary

PROJECT CASE	DO MINIMUM		
BASE CASE	BASE CASE (Do Nothing)	BASE CASE (Do Nothing)	BASE CASE (Do Nothing)
Capital (investment) cost, PVIC	$ 28	$ 77	$ 75
Operating cost, PVOC	$ -	-$ 7	-$ 2
TOTAL COST, PVC	$ 28	$ 70	$ 73
Travel Time Savings - Existing Public Transport Users	$ 13	$ 16	$ 28
Travel Time Savings - Switchers to Public Transport	$ 0	$ 1	$ 2
Travel Time Savings - Remaining Users (car)	-$ 0	$ 20	$ 36
Unperceieved car vehicle operating costs	$ -	$ 5	$ 8
Environment - Climate Change	$ 0	$ 1	$ 1
Environment - Air Quality	$ 0	$ 3	$ 6
Public Transport Revenue	$ 5	$ 5	$ 9
Road Accident	$ -	$ 5	$ 9
Other (derailment reduction)	$ -	$ 15	$ 16
Other (Train delays on Belair line)	$ 4	$ 2	$ 4
Residual value	$ -	$ 27	$ 14
TOTAL BENEFIT, PVB	$ 23	$ 101	$ 134
NPV	-$ 5	$ 30	$ 61
NPV/k	- 0.19	0.39	0.82
BCR = PVB/PVC	0.8	1.4	1.8

Source: Excel workbook – see separate detailed report *Rail Revitalisation Economic Appraisal, Excel Workbook Report* (Department for Transport, Energy and Infrastructure, 2007).

Figure 1: Benefit Components



4. SENSITIVITY TESTING

Sensitivity testing was undertaken for the preferred option (4 Year project). The results are presented in Table 4. They show that the Benefit Cost Ratio is most sensitive to the assumed discount rate.

Table 4: **Sensitivity Testing Results**

Test #	Variation	Benefit Cost Ratio 4 year project
0	Initial result	1.8
1	Discount rate 4%	2.8
2	Discount rate 8%	1.3
3	Capital cost: +50%	1.2
4	Operating cost: +50%	1.8

5. STRATEGIC ISSUES

5.1. South Australia's Strategic Plan Targets

5.1.1. Public Transport Use

South Australia's Strategic Plan has a target of increasing the use of Public Transport to 10% of metropolitan weekday passenger vehicle kilometres travelled by 2018.

Implementation of this project will directly assist in achievement of the target by reducing travel time and improving the reliability of the train service through reduced disruptions which will attract an incremental number of passengers.

The direct impact of this initiative can be assessed by comparing the base case results with the two project cases using the 2018 predicted travel.

Scenario	Contribution towards Public Transport target
Base case (Do nothing)	**Negative 1%**
Do Minimum	**No change**
4 and 25 Year Project Cases	**2% of total change needed to meet target**

5.1.2. Ecological Footprint

South Australia's Strategic Plan has a target of reducing our ecological footprint by 30% by 2050.

The timber redgum sleepers that are used now, and will continue to be for the foreseeable are from native forests and not plantations. There is considerable focus at the moment on the Murray River, which along with other rivers are the source of many of the redgum sleepers.

This project will reduce the impact that this forestry industry has on the environment.

5.1.3. Greater safety at Work

South Australia's Strategic Plan has a target of achieving the nationally agreed target of 40% reduction in injury by 2012.

Work on the rail system especially for workers who are required to approach operational rail lines is a high risk work environment. Over the past 150 years progressively more sophisticated and human factor aware safety systems have been implemented to reduce the risk to these workers, but have not resulted in elimination of risks. The United Kingdom, Her Majesties Railway Inspectorate[1] has noted that trackside workers are exposed to the highest risk of a fatality in the railway industry.

[1] UK Office of Rail Regulation, HM railway Inspectorate National Topic 6, Red/Green Zone Working, A report on the progress with maximisation of green zone working on rail track infrastructure.

This fatality rate can be compared to that in the construction industry which has traditionally been considered as high risk.

The most significant factor associated with this risk is Human failure where a combination of errors results in the track worker being in the wrong place at the wrong time. A report by the USA Federal Railroad Administration has investigated in depth all of the fatalities to rail workers in 2005.

Installation of concrete sleepers and new turnouts does not reduce the consequence of such accidents, but can significantly reduce the exposure that workers face, as the total time that they are on near the rail lines is significantly reduced as the maintenance requirements reduce, and the need to have staff near the track to control trains when they need to operate around work sites can be reduced.

Poor track condition which results in rough train ride can also have an impact on train worker safety. TransAdelaide has one workers compensation claim that is claimed to be attributed to this effect.

5.1.4. Greenhouse Gas Emissions

South Australia's Strategic Plan has a target of achieving the Kyoto target by limiting the state's greenhouse gas emissions to 108% of 1990 levels during 2008-2012, as a first step towards reducing emissions by 60% (to 40% of 1990 levels) by 2050.

It has been estimated that there will be a reduction in the level of Greenhouse gas emission of 5,000 tonnes per annum as a result of this initiative compared to the base case as the result of the increased use of public transport.

The production of concrete sleepers compared to timber sleepers initially produces higher CO2 emissions, compared to timber. Energy Strategies produced a report for the Australian Rail Track Corporation[2] that compared the CG2 emissions from concrete sleepers compared to timber sleepers. It was estimated that the emissions from the concrete sleeper production is 57.2 kg per sleeper, while timber is 34 kg per sleeper. Due to the longer life of the concrete sleepers compared to timber, and taking into account emissions from timber decay, it was also estimated that the complete life cycle emissions of concrete is 93 kg compared to timber of 540 kg over a 60 year period.

For this project therefore the selection of concrete sleepers will reduced the emissions from sleepers from 54,000 tonnes to 9,300 tonnes, or an average over 60 years of 1,000 tonnes per annum.

In total therefore it is assumed that there would be an annual average reduction in greenhouse gas emissions of 6,000 Tonnes.

[2] Review of CO2-e Emissions from Concrete versus Timber Sleepers, Australian Rail Track Corporation, 2007

5.2. Rail Safety

The National Rail Safety Regulators Panel in February 2006 reported to the Standing Committee on Transport (SCOT), Rail Group on the general safety areas that regulators have identified as requiring improvements, or present opportunities for achieving improvements for safe rail operations.

One of the 8 areas was aging rail assets and in particular they noted:-

"Australian railways have infrastructure and rollingstock assets consisting of a wide variety of technologies dating back to the 19th Century. Some of the older equipment (ie>50 years) is obsolete, is not supported by the original manufacturer and relies on the in-house experience of rail maintenance organisations.

While routine and corrective inspections and maintenance are usually adequate to keep equipment assets within specification, it may not be sufficient to stop "end of life" failures that may have serious consequences"

In addition they also note:-

"The problem is compounded by:-

- a shortage of skills and spare parts required to maintain obsolete equipment;
- escalating costs of maintaining obsolete equipment in the rail industry counter to the commercial drive to reduce maintenance costs to improve competitiveness;
- obsolete equipment with poor reliability possibly presenting an increased rail safety risk by having to operate under restricted mode for extended periods of time (eg track speed restrictions);
- replacement programs requiring long timeframes to plan and implement.

Rail Safety Regulators expect rail organisations to identify asset failure modes that could lead to derailments or train collisions and implement mitigation measures as part of their safety management system.

Rail organisations should also develop and implement the required asset replacement programs, as well as special maintenance requirements for maintaining obsolete equipment."

This initiative will directly address these concerns by replacing an aged, high maintenance asset, that is managed through the imposition of temporary speed restrictions, with one that meets current contemporary technical standards.

5.3. Benefits to other Strategic Infrastructure Plan for South Australia Proposals.

5.3.1. Electrification.

The Strategic Infrastructure Plan for South Australia has a project to "Investigate the electrification of the Metropolitan Heavy Rail network". If electrification proceeded before concrete sleepering was completed, the cost of concrete sleepering would increase by an estimated 20% as the project work on the track could not proceed until the overhead electrical wiring is switched off which takes up to an hour reducing the time available for work. The cost increase to implement the Rail Rectification initiative would be in the order of $40 million.

5.3.2. Seaford Rail Extension.

The Strategic Infrastructure Plan for South Australia has a project to "Investigate extension of the Noarlunga rail corridor to Seaford". The removal of speed restrictions as a result of the concrete resleepering project will increase the number of new passengers who would use the service. A detailed assessment of this is contained in the Seaford Rail extension investigation[3].

5.3.3. Rail Gauge Standardisation

The Strategic Infrastructure Plan for South Australia has a project to "Standardise and upgrade the state rail network where it has connectivity to the interstate main line". The installation of gauge convertible sleepers, level crossings and turnouts as part of this project will have a significant effect on reducing the cost of standardisation. This is due to the reduced time to undertake the conversion on concrete sleepered track and the loss of asset life of timber sleepers when gauge conversion takes place.

[3] Government of South Australia, Department for Transport Energy and Infrastructure, Extension of the Noarlunga Rail Line to Seaford, ~~September 2007~~.

REVISED page 10 of attachment (submission 101).

In addition they also note:-

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[3] September 2007.

APPENDIX A ASSUMPTIONS

5.4. Item	Assumption
Discount rate	6% - in line with Department of Treasury and Finance suggested values.
Evaluation period	30 years – Residual values used to deal with remaining asset lives which may be as long as 60 years for concrete sleepers.
Cost estimates	Source: TransAdelaide / Department for Transport, Energy and Infrastructure.
Parameter values for benefit estimation	Detailed within Excel workbook for this Benefit Cost Analysis.

APPENDIX B INVESTMENT

To assess the impact of the rail revitalisation project, a comparison is made between the projects investments costs and an estimate of the expenditure that would be undertaken over the evaluation period.

App B (a) Project Case Investment

The project case investments for the three project cases are:-

Do Minimum	25 Year Project Case (Alternative)	4 Year Project Case (Preferred)
$30 million	$140 million	$108 million

App B (b) Base Case Investment

There is an ongoing investment need in the base case which replaces and repairs defective track components on an as required basis. The current design of the track has a replacement cycle of between 20 and 30 years. The key elements of this investment are described in the following sections.

App B (b) (i) Timber Resleepering costs.

The average life of the redgum sleepers currently being used is reducing, due to the size and quality of the native growth trees, and it is likely in the next few years that hardwood timber sleepers suitable for railway purposes will not be available due to environmental restrictions. It is assumed in this analysis that the existing sleepers have an effective life of 20 years.

Sleeper replacement is not evenly spaced over time but tends to require a lumpy investment. It has been assumed that the cost of replacing each individual timber sleeper on an as required basis is around $200[4] which includes the replacement of the sleeper itself, a small amount of additional ballast, ensuring that the geometry of the finished track is to specification, material disposal, track safety protection and engineering support.

Case	Track distance (a)	Timber and steel sleepers (b) = (a) * 1,315/km	Sleeper replacement average per annum (c) = (b) / 20 years	Estimated annual cost reduction (d) = (c) * $200
Base Case (Do Nothing) Investment	65	85,000	4,250	$0.85 million

[4] DTEI/TransAdelaide estimate

App B (b) (ii) Rail life extension.

The life of the existing steel rail assets is influenced by a number of factors. One of the key elements is the vertical dynamic forces applied by trains causing fatigue failures in the rail welds and rails. TransAdelaide has an ongoing inspection program utilising an automated ultrasonic inspection vehicle to manage these defects. The level of defects can be reduced and the effective life of the rail increased by smoothing the surface of the rail. This can be done by straightening misaligned welds and grinding the rail surface. This technique was utilised on the recent Glenelg tram upgrade project and is used extensively on the Australian Rail Track Corporation's Interstate rail network.

The effect of undertaking the corrective work on the rail is to substantially extend its life. Rail life is often calculated by assessing the total gross tonnage that has been carried over the rails. It is estimated that the Noarlunga rail line would carry around 2 Million Gross Tonnes (MGT) per annum on each of its tracks (to and from Adelaide).

For this analysis it is assumed that the cost of rerailing is $200,000[5] per track km.

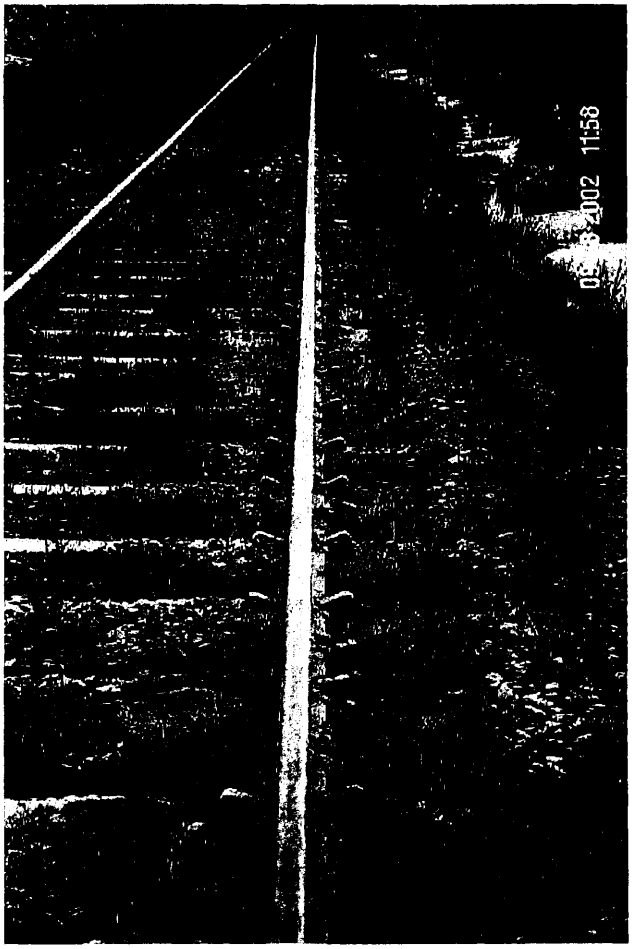
Work undertaken by Australian National in the early 1990's showed that with good rail maintenance practices rail life can be extended from 150 MGT to at least 250 MGT. Heavy haul railways are now routinely able to extend rail life to in excess of 1,000 MGT. A life increase from 150 MGT to 250 MGT has been assumed for this analysis.

Case	Track km (a)	Replacement cost of the rail (b) = (a) * $200,000/km	150 Million Gross Tonne Life (c) = (b) * 2 / 150	250 Million Gross Tonne Life (c) = (b) * 2 / 250	Annual benefit from rail life extension (e) = (d) – (c)
Base Case (Do Nothing)	65 km	$13,000,000	$173,000		
4 and 25 Year Project Cases	65 km	$13,000,000		$104,000	$69,000

App B (b) (iii) Avoided cost of Formation repair.

There will be an ongoing need to repair the formation as deterioration continues, causing damage to the track and deterioration in track geometry, both resulting in additional speed restrictions.

[5] TransAdelaide estimate



TransAdelaide have estimated that approximately 25.9 km of track may require formation repair, or 43% of the corridor. The Do nothing case has assumed that only 50% of this work would be undertaken, around 13 km, with the consequent risk that further work will be required at locations that are marginal.

TransAdelaide estimate that the cost of repair consists of $500,000 to undertake the repair itself, and $150,000 per km to dispose of contaminated material. Allowing for a 20% contingency for small scale project work this results in a formation repair cost of $780,000 per track km.

Case	Formation requiring repair (a)	Formation repair cost (b) = (a) * $780,000	Annual benefit from rail life extension (c) = (b) / 20
Base Case 1 (Do Nothing)	13 km	$10 million	$0.5 million

App B (b) (iv) Avoided cost of Level Crossing and Pedestrian Crossings.

The estimates for this 25 and 4 year projects include the cost to rehabilitate the level crossings and pedestrian crossings on the rail line. These crossings will all need replacement period if this project does not proceed.

There are 17 road and over 60 pedestrian crossings that will be upgraded.

The estimates for this project include the cost to rehabilitate the level crossings and pedestrian crossings on the rail line. These crossing will all need replacement over a 5 year period if this project does not proceed. The estimated cost is $170,000 for a road crossing and $10,000 for a pedestrian crossing. A 20% contingency has also been added to these unit rates resulting in costs of $204,000 for a road crossing and $12,000 for a pedestrian crossing.

Case	Number of level Crossings (a)	Number of pedestrian crossings (b)	Total Cost (c) = (a) * $204,000 +(b)* $12,000	Annual cost (d) = (c) / 20
Base Case (Do Nothing)	17	60	$4.188 million	$0.20 million

App B (b) (v) Avoided cost of turnout Replacement.

The estimates for this 25 and 4 year projects include the cost to rehabilitate and replace existing turnouts. These crossing will all need replacement period if this project does not proceed. There are 40 existing turnouts on the Noarlunga Centre line.

These turnouts have an estimated life of between 35 and 50 years. All of the turnouts will require replacement over the next 20 years. It is estimated that the cost of a new turnout is $250,000. Allowing for a 20% contingency this results in a total cost of $300,000.

Case	Number of Turnouts (a)	Total Cost (b) = (a) * $300,000	Annual cost (c) = (b) /30
Base Case (Do Nothing)	40	$12 million	$0.40 million

APPENDIX C OPERATING COSTS

The delivery of the project will result in long term cost reductions for TransAdelaide to maintain the existing asset, reduce train operating costs, reduce recurrent investment and provide a markedly safer infrastructure.

This section considers in detail the changes in operating costs required for all four cases.

App C (a) Operating Cost impacts of project delivery during construction

There are two operating cost impacts as a result of this project.

App C (a) (i) Substitute bus services.

Substitute bus services classified as recurrent consistent with Attorney General's interpretation of appropriate accounting treatment made in 2005-06.

It is estimated that the cost of bus substitute services is $5.7 million.

App C (a) (ii) Waste Ballast Fines Disposal costs.

Waste ballast fines disposal costs have been classified as recurrent as these costs relate to disposal of asset being replaced rather than an investment in the asset being created.

The cost estimate for the disposal of waste ballast fines is $7.48 million.

App C (b) Operating Cost changes

App C (b) (i) Infrastructure maintenance.

The installation of concrete sleepers reduces the need for minor maintenance, inspection and defect repair. TransAdelaide expenditure on track maintenance is $6.2 million, but represents a funding shortage, and a base case funding of $8 million has been assumed to recognise this.

The estimate of the annual cost savings from implementation of this project is $780,000 per annum.

The cost differences between the Base and Project cases are shown on the following table:-

Case	Estimated annual cost
Base Case (Do Nothing)	$8.0 million
Do Minimum	$8.0 million
4 and 25 Year Project Cases	$8.0 million for 3 years reducing to $7.22 million at end of investment

App C (b) (ii) Train Maintenance

TransAdelaide undertakes its railcar maintenance through a contract with Bombardier Transportation. Since the contract's commencement the worsening track condition has lead to higher vehicle maintenance costs than anticipated, including shock absorber replacement rates and failure of equipment. Bombardier have an opportunity to revise pricing in 2010, mid way through the railcar contract An initial estimate is that this increased cost over the long term will be in the order of $280,000 per annum.

The following shows the estimated annual cost of train maintenance under each option.

Case	Estimated annual cost
Base Case (Do Nothing)	$11.97 million (from 2010)
Risk Reduction (Do Minimum)	$11.97 million (from 2010)
4 and 25 Year Project Cases	$11.97 million from 2010, reducing to $11.69 million at end of investment

App C (b) (iii) Train fuel consumption

The effect of the timber sleepered track with its temporary speed restrictions and rough riding conditions has created additional fuel costs. An assessment of the fuel consumption saving under the project options 2 and 3 has been estimated at around 8%.

The current fuel cost on the TransAdelaide network, after receipt of the fuel rebate, is $7 million. An 8% saving on fuel consumption would result in total fuel savings of around $242,000 per year.

Case	TransAdelaide Fuel Cost
Base Case (Do Nothing)	$7.0 million (from 2008)
Risk Reduction (Do Minimum)	$7.0 million (from 2008)
4 and 25 Year Project Cases	$7.0 million (from 2008), reducing to $6.76 million at end of investment

APPENDIX D BENEFITS

The quantified benefits that result from the Rail Revitalisation project are:-

- Fare revenue;
- Travel Time impacts;
- Road vehicle operating cost impacts;
- Transport safety; and
- Environmental impacts.

The other benefits and residual values are calculated separately.

The passenger impacts for the 25 Year case and the preferred 4 year case are only shown for the 4 year case. The 25 year case has assumed that these benefits gradually increase to the level of the 4 year case over 25 years.

App D (a) Estimation of Transport Impacts

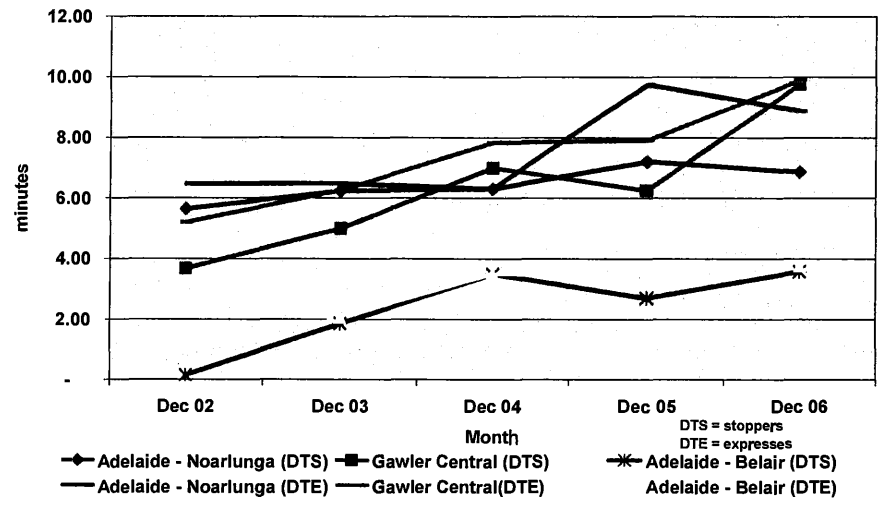
Non-commercial transport projects such as road construction and public transport initiatives generally are not able to provide a financial rate of return, as many of the benefits that arise from the initiative are not able to be financed through fees or charges.

To assess the external beneficiaries of these transport projects an estimation of the impact on a number of groups needs to be determined. The determination of the impacts, in other words assessing the market demand and determining a monetised assessment of the benefits that they obtain, is undertaken by the use of travel demand forecasting models.

For Adelaide these changes can be assessed using the Metropolitan Adelaide Strategic Evaluation Model (MASTEM) which is a mathematical transport demand forecasting model of the Adelaide urban area that has been developed by the Department for Transport, Energy and Infrastructure for the assessment of changes to Adelaide's road and public transport system.

For this project the only variable that is changed is the travel speed, with the basic train frequency, stopping patterns and vehicle performance being held constant. Travel time is predicted to increase in the base case as there will be additional temporary speed restrictions imposed on the infrastructure as it deteriorates and not repaired. The trend data is shown on the following charts.

Figure 2 - Temporary speed restrictions attributable to track condition



For this analysis a series of indicative timetables have been produced based on the following simplified assessment.

Case	Noarlunga Centre corridor	Belair corridor
Base case (Do nothing)	15 % slower trains than now	15 % slower trains than now
Do Minimum	15 % slower trains than now	5% faster trains at end of the project
4 and 25 Year Project Cases	5% faster trains at end of the project	5% faster trains at end of the project

Train schedules, have been produced using the OpenTrack simulation software which is used by TransAdelaide for operational planning.

These schedules are then used by the MASTEM software to produces the following summarised daily travel demand predictions. Further specific results are contained in the sections below but the strategic results are:-

Case	Increase in daily train boardings	Increase in public transport passenger km per day
Do Minimum	1,000	9,800
4 and 25 Year Project Cases	3,600	38,000

App D (b) Train Capacity

This initiative does not assume any change in the frequency of train services but the number of boardings has an effect on the loading that is being achieved on the trains. A check is required to ensure that TransAdelaide has the capacity to carry the additional patronage assessed by MASTEM.

MASTEM has predicted that that the number of passengers using the rail services will increase as a result of this initiative. The critical time for the analysis of capacity is during the morning peak hours. The morning peak carries about 12% of the daily passengers and hence based on the additional 3,100 passengers there would be an increase in demand of 440 passengers. This is equivalent to just over three railcars assuming an average peak loading of 130 passengers per railcar. There are 26 trains currently scheduled to arrive in Adelaide on the Noarlunga Centre and Belair lines during the morning peak hours. If the new boardings were evenly distributed on each train then there would be an additional 17 passengers per train, or about 8 per railcar..

TransAdelaide is planning in 2007 to reintroduce 5 stored railcars to service to provide additional capacity.

Due to the improved ride, shorter journey times and more reliable service the willingness of passengers to stand will increase.

It has been assumed that there is no need for additional train capacity as a direct result of this initiative.

App D (c) Fare Revenue

The increase in passengers results in an increased level of revenue from the sale of tickets. The current average fare is $1.35 per trip, which may include a number of transfers between services and does not account for incentive payments to contractors which is discussed in the previous section on operating costs. The number of trips are determined from the MASTEM analysis.

Case	Passenger trip increase per day (a)	Passenger trip increase per annum (b) = (a) * 280	Fare Revenue increase (c) = (b) *$1.35
Do Minimum	1,300	364,000	$0.49 million
4 and 25 Year Project Cases	2,100	588,000	$0.79 million

App D (d) Travel Time Savings

App D (d) (i) Reduced travel time of existing users.

This project will result in the reduction of travel time by existing users due to faster train speeds. The trip time has been valued at $10.00 per hour, and a travel time weighting of 1.2.

The value of this improved travel time has been assessed as shown in the following table which assesses the change across the complete rail network

Case	Average time per passenger km change from Base Case (a)	Base passenger km on rail (b)	Travel time savings (c)=(a)*(b)*$10 *1.2/60
Do minimum	-0.031 minutes per passenger km	96 million	$0.6 million
4 and 25 Year Project Cases	-0.123 minutes per passenger km	96 million	$2.4 million

App D (d) (ii) Reduced travel time of users who change to rail.

This project will result in the reduction of travel time by those users who switch to rail and take advantage of faster train speeds. The trip time has been valued at $10.00 per hour. The economic rule of half applies to this calculation (see Appendix E).

The value of this improved travel time has been assessed as shown in the following table

Case	Average time per passenger km change from Base Case (a)	Base passenger km on rail (b)	Project Case passenger km on rail (c)	Travel time savings (d)=(a)*[(c)-(b)]*$10*1/2 *1.2 /60
Do minimum	-0.031 minutes per passenger km	96 million	99 million	$0.093 million
4 and 25 Year Project Cases	-0.123 minutes per passenger km	96 million	113 million	$0.2 million

App D (d) (iii) Travel time change due to the change in Road Congestion

The effect of people travelling on train due to the reduced travel time is that those people who stay on the road network face a marginally lower level of congestion. The current value of travel time for road users is $15 per hour.

MASTEM predicts an incremental increase in average speed across metropolitan Adelaide.

Case	Average time per car passenger km from base case (a)	Car passenger km per annum (b)	Annual benefit (c) = (a) * (b) $15.00
Do Minimum	No saving	9.395 million	$0
4 and 25 Year Project Cases	-0.0014 minutes per passenger km	9.395 million	$3.2 million

App D (e) **Road Vehicle Operating Costs.**

The National Guidelines for Transport System management in Australia have identified that "*travel decisions are made on the basis of the perceived (generalised) cost of travel options. The perceived cost (sometimes also called the 'behavioural cost' because of its influence on behaviour) will usually include financial costs such as tolls and fares and the value of travel time. Computerised travel demand models are based on perceived travel costs. The perceived benefit to users of an initiative will be the (net) reduction in the perceived cost of travel with the Project Case compared with the Base Case.*

However, car users do not correctly perceive the full economic costs of their travel for three reasons:

- *When making travel decisions, motorists fail to take account of all of the actual financial costs they incur because of poor information, the structure of prices and the interval between purchasing the good and using it. For example, a motorist may replace tyres every few years, and forget the wear and consequent cost of tyre use when making individual trip decisions. Similarly,*
- *people may not correctly perceive the cost of fuel when making travel decisions because of the time separation between paying for the fuel and using it. This gap is likely to be even greater in the case of use-related depreciation of a car.*
- *The actual financial costs that motorists pay include taxes, which are a transfer payment that does not represent use of any resources.*

The formula that is used in determining this resource correction is:-

- *Car-kilometres of reduced vehicle use * (resource cost of car travel per kilometre – perceived cost of car travel per kilometre)."*

The reduction in car use is determined from the MASTEM analysis.

The difference between the resource cost and perceived cost has been estimated by Dr David Bray (2006) to be 4.5 cents per car km.

Case	Car travel distance reduction (a)	Total Benefits (b) = (a)*$0.045
Do minimum	No change	$0
4 and 25 Year Project Cases	16 million	$0.72 million

App D (f) Transport Safety

South Australia's Strategic Plan has an objective of reducing road fatalities (T2.9). MASTEM has estimated that there will be a reduction of 16 million car km when the project has been implemented.

The transport safety benefit from this reduction in car use has been assumed to be $0.05 per km.

Case	Car km per annum reduced (a)	Annual benefit (a) * $0.005
Do Minimum	No change	$0
4 and 25 Year Project Cases	16 million	$0.8 million

App D (g) Environmental Benefits

Environmental benefits arise from the change in the type of energy used to move people. In the case of this project it has been assumed that the public transport resources required to move the induced patronage from this initiative is small and consequently ignored. The most significant change is from the shift of people from cars to public transport. It has also been assumed that the mix of the way cars are fuelled does not change.

The detailed calculations are shown in the attached spreadsheet and summarised in the following table which has assumed a value of Greenhouse Gas of $290 per tonne, and air quality of $:-

Case	Greenhouse Gas	Air Quality
Do Minimum		
4 and 25 Year Project Cases	$0.3 million (-14,500 Tonnes per annum)	$1.4 million.

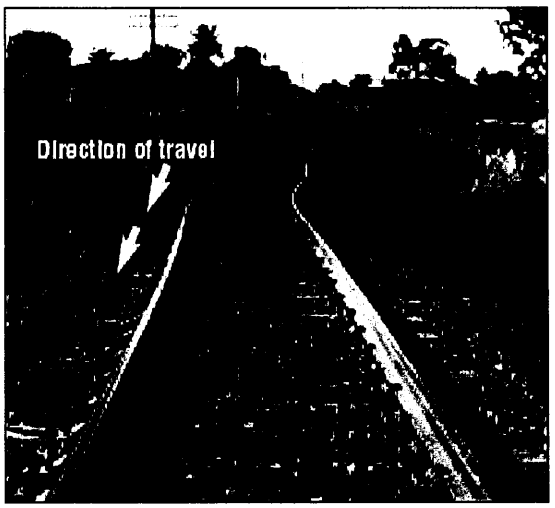
App D **(h)** **Other** Benefits

App D (h) (i) Track Buckling Reduction.

Track buckling is where a sudden lateral misalignment appears in the track. If this type of defect if not detected can lead to train derailment. When rails get hot there is an increase in the compressive force along the track. If the rail is not held in place it tends to form a curve to relieve that force. Track buckles form when the sleepers and ballast can no longer resist the lateral forces.

Installation of concrete sleepers has proven to be one of the most effective ways to stop track buckling, primarily due to the significantly heavier sleeper.

TransAdelaide has a history of track buckles. During the summer months there is an inspection and corrective action process put in place to manage these defects. Even with this maintenance strategy in place there is still a residual derailment risk. There are a number of derailments around Australia known to have been caused by Track Buckles on timber sleepered track and so the risk of a derailment is high. The consequences of a derailment can vary from minor damage to the track, train and minor injuries to the derailment causing a train-to-train collision. An example is a derailment that occurred at Ararat in 2003, where the derailment was observed by two track workers. This risk can be eliminated by this project.



An assessment of the impact of this risk reduction is made using information available from the Federal Railroad Administration in the USA who have an extensive range of data available to assess the probability and consequence of risk for trains. This is a very extensive database, and has records for rail operations 4,000 times more extensive than TransAdelaide's operation, providing a reliable statistical database.

The probability of risk using the Federal Railroad Administration data is assessed by Anderson and Barkan[6] where they determine the probability of derailment, by differing track classes. The current 90 km/hr maximum speed timber sleepered TransAdelaide track is equivalent to an Federal Railroad Authority Class 3 track which has a maximum speed for passenger trains of 96 km/hr. The probability of derailment, for all trains due to all causes is 300 cars derailed for every billion freight car miles (480 per billion km).

A closer examination of the derailment risk causes shows that 3.5% are due to track buckles. TransAdelaide's North South train services total around 75% of the total 7.8 million railcar km running over them, which means that the current derailment probability due to track buckles is 0.10 or once every 10 years (3.7% * 75% * 7.8 million * 480 / 1 billion).

The consequences of this type of derailment is determined by looking at the statistics for Amtrack, which is a government owned passenger train operator in the USA. Over a 10 year period there have been 3 derailment due to track buckles which has resulted in an average of 1.3 fatalities, 44 serious injuries and US$2.4 million of property damage.

Using the Austroads unit rates of $1.778 million per fatality and $424,000 for a serious injury the likely cost of such a derailment in Australia would be approximately $24 million.

Case	Railcar km (a)	Railcar derailment probability due to track buckle (b) = (a) * 480 / one billion *3.5%	Estimated annual risk
Base case	0	0	$2.4 million
Do Minimum	385,000	0.0065	$0.155 million
4 and 25 Year Project Cases	3,600,000	0.0605	$1.45 million

App D (h) (ii) Train Delays on Belair Line

The TransAdelaide Belair line is alongside the Australian Rail Track Corporations Interstate Mainline. The two tracks are very close and the ability of TransAdelaide to maintain the spacing between the tracks raises the risk profile of a collision between a TransAdelaide Railcar and a Freight train. To control this risk TransAdelaide will be stopping the railcars at the point where the freight train will pass the railcar. This will impose a delay of 5 minutes to each railcar. There will be approximately 3,800 such instances each year and assuming that there are 55 passengers on each train, a value of time of $10 and a weighting of 2 due to waiting then the annual benefit is $350,000.

The installation of concrete sleepers along the outer section of the Belair line will remove the need for trains to stop and hence provide this as a benefit.

[6] Transportation Research Record 1863

App D (i) Residual Value

This economic analysis has an evaluation period of 30 years. The assets that are being installed as part of this project proposal have much longer life than this, for example concrete sleepers are estimated to have a life of around 60 years. Some of assets installed have a shorter life, for example level crossings, while others have a much longer life, for example the costs associated with the removal of contaminated ballast. For this analysis it is assumed that the average life of the assets is approximately 60 years.

It is assumed in the base case that the existing assets are replaced with assets that have a life of 20 years. It is also assumed in the do minimum case that the majority of assets are replaced with those that have a short asset life.

Case	Investment	Residual value
Base case (Do nothing)	$0 million	$26 million
Do minimum	$30 million	$26 million
25 Year Project Case (Alternative)	$288 million	$168 million
4 Year Project Case (Preferred)	$238 million	$133 million

APPENDIX E METHODOLOGY

Standard BCA was used for the analysis in line with the Department for Treasury and Finance Guidelines (2006) and national guidelines for appraisal of transport initiatives (Australian Transport Council, 2006).

A few specific items are discussed below.

Benefit cost ratio: The Benefit Cost Ratio is determined here using the formula:

$$BCR = \frac{PVB}{PVC}$$

where $PVC = PVIC + PVOC$

PVIC is PV capital (investment) cost and

PVOC is PV operating cost.

The alternative BCR approach, where *PVOC* is in the numerator as a disbenefit (- *PVOC*) rather than the denominator, is not used here since it is an unreliable measure in cases where *PVOC* is significant in size relative to *PVIC.*

'Rule of a half': Benefits to 'new users' of public transport were estimated using the standard methodology in applied benefit cost analysis of the 'rule-of-a-half' to estimate the benefits to 'new users' of a service (e.g. DFA, (2006) p.34; Boardman *et al* (2001) pp. 51-52); ATC (2006), Vol 3 p.66, Vol 4, p.26; Button (1994) p.183)).

Unperceived car vehicle operating costs: ATC (2006, Vol 1 section 2.6, Vol 4 section 3.4) requires that specific recognition be taken of unperceived car user costs (tyres, maintenance, depreciation attributable to use) in economic appraisal. An decrease (increase) in car use requires that these unperceived costs be recognised as a benefit (disbenefit).

References

Australian Transport Council (2006) *National Guidelines for Transport System Management in Australia* 2nd edition

Boardman AE, Greenberg DH, Vining AR and Weimer DL (2001) *Cost Benefit Analysis: Concepts and Practice*, 2nd edition, Prentice Hall

Button KJ (1994) *Transport Economics*, 2nd edition, Edward Elgar

Department of Finance and Administration (2006), *Handbook of Cost Benefit Analysis*, Australian Government

Department of Treasury and Finance (2006) *Guidelines for the Evaluation of Public Sector Initiatives* draft, South Australian Government

Department for Transport Energy and Infrastructure (2007) Rail Revitalisation *Economic Appraisal, Excel Workbook Report.*

APPENDIX C

Sustainability Management Plan

1. Project Description:

As part of the 2007/08 State Budget the Government announced a $121m upgrade of the State's rail track, the first key step in the revitalisation of the network. To be undertaken over four years, this work will provide the foundation of a cost effective, sustainable and modern metropolitan transport network.

Delivering safe and reliable services is recognised as the highest priority for the travelling public, and will continue to be into the future. Today, parts of the rail track and infrastructure are reaching the end of their useful economic lives. The consequence of this in some cases is a reduction in train speeds in affected parts of the network. This has a direct impact on train on-time running, and passenger satisfaction.

The Rail Revitalisation project will bring the track on the key Noarlunga and Belair lines to a high level of integrity.

The Rail Revitalisation project includes the following major components:

- Over 65 kilometres of new track, including the construction of new base layer, drainage, long life concrete sleepers and new rail where required, significantly increasing track stability and reducing journey times. This will provide more reliable services and enhanced passenger comfort and safety. Concrete sleepers have a longer life than the existing timber and steel sleepers, resulting in deferred replacement as well as reduced ongoing operating and maintenance costs
- Replacing turnouts, switching equipment and upgrading to concrete bearers in locations with high frequency usage and where assets are approaching the end of their effective lives,
- Construction of new track crossover switches to allow for future operational flexibility.
- Upgrade of 17 road level crossings, replacing bitumen with long life concrete, thus providing a smooth ride for motorists.

The Rail Revitalisation project is to be delivered jointly by the Office of Major Projects and Infrastructure (OMPI), Department for Transport, Energy and Infrastructure (DTEI) and TransAdelaide.

The Sustainability Management Plan is being developed during the planning phase of the project, where concept design for track upgrade options are being developed. The report assumptions will therefore need to be revisited prior to construction.

2. Summary

A DTEI Environmental Assessment will be completed for the project to identify key environmental issues, impacts and management measures and to obtain internal environmental approval.

The key issues of sustainability relating to this project are:

Operational and Construction Noise

Existing Noise Profile

Noise principally from interstate freight and passenger trains using the existing shared corridor on the Belair Line can currently be heard by adjacent residents. Residents currently are exposed to trains accelerating, decelerating and wheel squeal as the trains traverse the tight radius bends that exist unavoidably along the length of the line from Sleeps Hill Tunnel to Belair. Residents along the Noarlunga Line are exposed to noise associated with the acceleration and deceleration of trains, however wheel noise is not a significant issue along that line due to the significantly greater curve radii to be found on that line.

Reduction in Operational Noise

A key benefit in upgrading the rail track infrastructure will be the reduction in operational rail noise. Removal of rail joints and replacement with continuously welded rail on the new concrete track will significantly reduce wheel – rail impact noise.

Construction Noise

Construction noise will be an unavoidable issue during construction works given the proximity of the rail alignment to residential properties. All reasonable and practical noise mitigation measures will be implemented during construction. The nature of the track upgrade is such that works in any particular location along the project site will be relatively short in duration, thereby minimising disruptions to residents.

All works will be planned and undertaken in accordance with the Environment Protection (Industrial Noise) Policy 1994, and EPA Information Sheet 424/04 – Environmental Noise. It is likely that due to the nature of the works, some night works will be necessary. All night works will be undertaken in accordance with the principles of DTEI Draft Operational Instruction 21.7 – Infrastructure Works at Night, as endorsed in principle by the EPA.

All works undertaken directly by TransAdelaide will need to comply with the requirements of its licence conditions, which states:

> *The licensee must not cause or permit excessive noise, as prescribed in the Environment Protection (Industrial Noise) Policy 1994, to be emitted from any machine or tool used during the normal maintenance of the railway system between the hours of 8:00pm on any night until 8:00am the following morning unless emergency or exceptional circumstances occur where work must be carried out to open the track for the safe passage of railway traffic.*
>
> *NOTE: Thereafter higher levels of noise may be emitted provided that machines or tools are fitted with manufacturer-specified noise attenuation equipment and are used in the least noisy manner.*

All works undertaken by Contractors will be required to conform to the requirements of TransAdelaide's Environmental Licence.

Notwithstanding the requirement to work under the conditions thereof, Contractors are not able to operate under authority of TransAdelaide's Licence, and shall be responsible for obtaining all necessary licences and/or authorisations for activities prior to the commencement of works.

The community shall be kept fully informed throughout the planning and implementation of the project through regular and ongoing communication.

Site Contamination Remediation

A significant volume of ballast fines material within TransAdelaide track infrastructure is contaminated. The main source of this contamination is from the historical application of arsenic based weedicides along the track. Other sources of contamination include hydrocarbon contamination from grease and oil spills and the use of contaminated fill materials (for example combustion wastes from steam locomotives) during original construction of the railway.

Removal of the material will be subject to a detailed remediation management plan to ensure that that contaminated material is handled in accordance with appropriate safety requirements and that excessive dust is not generated. TransAdelaide have undertaken trials to separate contaminated fines from non-contaminated ballast thereby greatly reducing the volume of contaminated material requiring disposal of landfill. Subject to receiving EPA Environmental Authorisation to undertake this activity, a similar process will be implemented on this project.

Waste Minimisation

The track upgrade has the potential to generate significant volumes of waste materials through waste streams associated with ballast, sleepers, rail and contaminated fill materials. The project team will adopt the principles of the waste management hierarchy as outlined in the Zero Waste SA Act, 2004 – a widely accepted guide for prioritising waste management practices with the objective to obtain the most favourable environmental outcome. Where possible these materials will be either be reused as part of the project or recycled elsewhere. Steel sleepers and rail that cannot be reused by TransAdelaide are often made available to heritage railways or will be recycled as scrap. Wooden sleepers (non-creosote) will either be reused for landscaping purposes or recycled as mulch. Methods will be investigated for recycling\reuse of creosote treated timber sleepers (whole sleepers only).

The contamination management process will generate two waste streams comprising cleaned ballast and contaminated fines material. The project team currently is investigating options to separately reuse these two waste streams. All recycling and reuse of material will be undertaken in accordance with the Environmental Protection Act, 1993 and DTEI Operational Instruction 21.6 - Recycled Fill Materials for Transport Infrastructure.

Reduction in Greenhouse Gas Emissions

This project will reduce road congestion and increase patronage of public transportation resulting in 16 million less car kilometres by 2018 and a subsequent reduction of 6,000 tonnes of greenhouse gas emissions (based on MASTEM model). This is consistent with Target 3.5 of the State Strategic Plan.

3. Environmental Impact Assessment, Legislative Compliance & Contract Management

Table 1. External Approvals

Native Vegetation Approval	N/A	Native Vegetation Council approval under the *Native Vegetation Act, 1991* is not required for this project.
Significant Trees Approval	TBA	If required, a vegetation survey will be completed to determine whether any significant trees will require removal for the project.
Water Affecting Activities Permit	TBA	A Water Affecting Activities permit application under the *Natural Resources Management Act, 2004* may be required where works will be undertaken in and around watercourses along the rail corridors.
Development Approval	√	A Crown Development Application under the *Development Act, 1993* is required for works affecting a heritage place or area.
Environment Protection and Biodiversity Conservation Act, 1999 Approval	N/A	EPBC Act approval is not required for this project.
Environmental Authorisation	TBA	Environmental Authorisation may be required for contaminated material treatment under the *Environmental Protection Act, 1993*

A number of reports will be commissioned in the near future in response to legislative requirements or internal environmental systems, as part of the environmental impact assessment process. These include;

Natural Resources Management Act, 2004; Environmental Protection Act, 1993 requirements:

- Rail Revitalisation Water Quality Risk Assessment (DTEI document–to be undertaken)
- Construction Noise Mitigation and Monitoring Plan (to be undertaken)
- Site Contamination Assessment (work currently underway)
- Site Contamination Remediation Plan (to be undertaken)
- Waste Management Plan (to be undertaken)

Development Act, 1991 and / or internal DTEI Environmental Systems requirements:

- Vegetation Survey (to be commissioned if required)
- Crown Development Application for works affecting a heritage place or area.
- Environmental Assessment (internal DTEI document – to be undertaken)
- Environmental Management Plan (DTEI requirements for Contractor – to be written)

An Environmental Assessment will be completed to obtain internal environmental approval. Other legislative requirements include compliance with the *Environmental Protection Act, 1993* during the construction of the project in relation to noise and site contamination, and compliance with the *Environmental Protection Act, 1993* and *Natural Resources Management Act, 2004* in relation to water quality, as well as compliance with the *Development Act, 1993* for the works affecting a heritage place or area.

The project will incorporate the issues raised through the environmental assessment process. The construction will be undertaken in accordance with standard DTEI environmental clauses including project specific clauses that will form the basis of an Environmental Management Plan for the works. Issues of sustainability, including compliance with Parts 150 and 155 of the Master Specification, will be abided by for the construction of the project. In response to these environmental requirements the Constructor will prepare an Environmental Management Implementation Plan (EMIP) and environmental audits will be undertaken during construction to ensure the Constructor's compliance.

4. Overview Table

The Overview Table outlines the Environmentally Sustainable Development (ESD) objectives, principles and example ESD actions and opportunities for the project and uses arrows to demonstrate whether the action could be classed as heading towards or away from sustainability (or maintaining status quo).

The overview table outlines EDS objectives and provides a framework and tool for assessing how a project/action or option is contributing towards sustainability, maintaining status quo or moving away from a sustainable outcome. The table includes assessment criteria (bold) for each objective as well as principles and example actions/measures that a project may adopt during planning, design and/or construction phases. In assessing a project the assessment should be against the 'base case' or do nothing option (which may assume a certain level of existing impact).

	Reducing Sustainability (Adverse impacts) ⇦	**Neutral – Status quo**	⇨ **Enhancing Sustainability – (Positive impact)**
ESD Objective (focusing on "Attaining Sustainability")	**Guiding Assessment Criteria (Bold) and example actions/opportunities (dot points) for incorporation into project**		
Protection of Water Quality	**Detrimental impact on water body - decline of health of receiving environment**	**No net change to water quality**	**Contributes to improved health of waterways and water quality**
		• Implementation of Soil Erosion & Drainage Management Plan (SEDMP) for construction works. • Limiting disturbed areas through defining Contractors Activity Zone. • Appropriate storage of hazardous substances used during construction. • If required, obtaining Water Affecting Activities Permit for works undertaken in and around watercourses along the rail corridors. • A Water Quality Risk Assessment will be undertaken to determine risks and management measures required. • Removal of contaminated fines from the ballast will reduce the risk of mobilisation of contaminants into any adjacent waterways.	•
Water Conservation and Reuse	**Ongoing or large increase in water consumption during life of project**	**No net change in water consumption patterns over life of project**	**Decrease in water consumption**
	• Small increase in water consumption during construction of project, for necessary dust control while working in close proximity to sensitive residential areas.	• Compliance with state water conservation measures and restrictions forms a part of standard contractual requirements.	• Use of alternative water (non mains, recycled water) when available during construction will be investigated.
Minimisation of energy consumption, use of renewable energy sources	**Large increase in energy use over life of project with no measures taken to mitigate or reduce**	**No significant increase/change in energy use, any impacts short term only**	**Minimisation of energy consumption over the life of the project and/or use of renewable energy resources / Decrease in energy consumption**
	• Embodied energy associated with the concrete sleepers, new ballast and steel rail line materials • Energy required to construct the new rail infrastructure	• Use of locally sourced ballast material • Use of localised operators and cartage contractors where possible Investigations under way to minimise or eliminate transport of waste materials, in accordance with Environmental Protection Act, 1993 requirements.	• Project will reuse ballast and steel rail where possible and recycle ballast, steel rail, steel sleepers and wooden sleepers where possible. • Utilises opportunities for use of recycled fill materials in accordance with DTEI Operational Instruction 21.6 - Recycled Fill Materials for Transport Infrastructure • Concrete sleepers have significantly longer life expectancy
Minimisation contribution to greenhouse gas emissions	**Significant contribution to increased GHG emissions over life of project with no measures taken to mitigate or reduce**	**No net change**	**Minimising project contribution to GHG emissions or improvements to current scenario**
	• Greenhouse gas emissions associated with the production of the concrete sleepers, ballast and steel rail line materials that comprise the track infrastructure upgrade • Greenhouse gas emissions associated with the construction of the new rail infrastructure.		• The aim of this project is to provide a more efficient and reliable metropolitan rail transport network thereby promoting the use of public transport as an alternative mode of transportation than by private car, reducing fuel consumption and GHG emissions. An estimated reduction of 6,000 Tonnes of greenhouse gas emissions (based on MASTEM model) due to the extent of the shift in transport usage from cars to rail. This is consistent with Targets 3.5 and 3.6 of the State Strategic Plan. • Reduce need for consumption of hardwood for sleeper manufacture
Minimisation of Air Emissions (To be considered for urban projects)	**Increase in air emissions and their impacts in local environment**	**No significant change or ongoing impact due to project**	**Minimisation of air emissions and impacts on a local scale**
	• A short term increase in air emissions from construction plant during construction works. Increase in road traffic and associated emissions caused by reduction in train service during construction works.	• An Environmental Management Plan will be developed and implemented along with the standard requirements of DTEI contract documentation to include the management of dust and to ensure machinery is maintained to minimise air quality impacts during construction. • Air quality will also be addressed in the remediation management plan to ensure adequate control of potential dust generation during contaminated material handling and treatment.	
Waste Minimisation and use of recycled materials	**No control measures to minimise Project Construction Waste to Landfill and/or incorporate recycled or recyclable materials**	**Control measures in place to manage waste. Use of Recycled and Recyclable Materials.**	**Reduction and avoidance of waste to landfill.**
	• Some creosote timber sleepers may be unable to be reused and will therefore require disposal to licensed landfill.	• A Waste Management Plan will be developed as part of the project. Generation of waste is to be avoided or minimised – DTEI will adopt the principles of the waste management hierarchy (as outlined in the Zero Waste Act) for prioritising waste management practices. • Steel sleepers and rail that cannot be reused by TransAdelaide will be recycled as scrap. • Wooden sleepers (non-creosote) will either be reused for landscaping purposes or recycled as mulch. DTEI will investigate	

The overview table outlines EDS objectives and provides a framework and tool for assessing how a project/action or option is contributing towards sustainability, maintaining status quo or moving away from a sustainable outcome. The table includes assessment criteria (bold) for each objective as well as principles and example actions/measures that a project may adopt during planning, design and/or construction phases. In assessing a project the assessment should be against the 'base case' or do nothing option (which may assume a certain level of existing impact).

	Reducing Sustainability (Adverse impacts) ⇦	**Neutral – Status quo**	⇨ **Enhancing Sustainability – (Positive impact)**
ESD Objective (focusing on "Attaining Sustainability")	**Guiding Assessment Criteria (Bold) and example actions/opportunities (dot points) for incorporation into project**		
		methods for recycling\reuse of creosote treated timber sleepers (whole sleepers only). • Separated ballast to be reused on project site where possible. • Separated fill materials are intended to be recycled in accordance with the DTEI Operational Instruction 21.6 - Recycled Fill Materials for Transport Infrastructure. •	
Protection of terrestrial and aquatic Biodiversity	**Loss of areas of biodiversity value, significant impact on population or species of conservation significance**	**No ongoing impacts on biodiversity / Protection of Biodiversity**	**Improvement to significant areas of biodiversity or conservation significance**
	• Very few potential biodiversity impacts are expected given the highly degraded/urban nature of the project site.	• All works will occur in the existing rail corridor. • The EMP will specify the Constructor's Activity Zone, which will restrict works to minimise impact on vegetation and fauna. • If a particularly sensitive downstream environment is identified from the Water Quality Risk Assessment then a treatment train approach to managing this risk will be adopted.	•
Management of Land Degradation and Contamination	**Project contributes to land degradation or creation/mobilisation of contamination**	**No exacerbation of land degradation or impacts associated with Contamination**	**Minimise land degradation or impacts associated with Contamination. Rehabilitation of contaminated sites**
		• No introduction of potentially contaminating activities to the project site will take place without treatments in place. Contract documentation will require the construction contractor to undertake all necessary measures to ensure no impacts from these activities. • Minimise land degradation including erosion control especially during construction through the implementation of Soil Erosion Drainage Management Plan.	• There are expected to be significant pre-existing contamination impacts to the rail corridor, and an investigation is currently being undertaken to characterise these contamination risks. • Site contamination remediation will involve the excavation of contaminated materials and treatment of these materials to separate the ballast from the fines material, greatly reducing the volume of contaminated material requiring management. Site contamination handling and treatment will be subject to a detailed Site Contamination Remediation Plan, which will be developed in consultation with the Environment Protection Authority, including any necessary approvals that may be required in order to implement the remediation plan.
Reduction in Transport Noise Impacts	**Increased noise levels likely to create ongoing impact on sensitive receptors**	**No ongoing impact on noise sensitive receptors**	**Minimising impacts of noise on sensitive receptors**
	• Anticipated increase in road traffic noise caused by reduction in train service during construction works as normal train commuters required to source alternative transportation modes.	• A noise mitigation strategy will be implemented during construction with particular attention paid to any works that will be undertaken during the night, in accordance with the Draft DTEI Operational Instruction: Infrastructure Works at Night.	• Operational rail noise potentially improved through reduction in wheel squeal noise where rail track infrastructure is stabilised and improved, and conversion from jointed rail to continuously welded rail.
Support and Encouragement of Social and Community Involvement and Consultation	**Community disengagement and alienation**	**Informed community and stakeholders**	**Establishment of relationships with community, stakeholders, customers and suppliers**
		• A detailed community consultation program will be undertaken for the project including engaging with the community prior to the project to establish a community sense of ownership. Letterbox drops will form a key component of the information sharing process. A consultation Strategy will be developed with two staff dedicated to community consultation. • Ongoing Stakeholder consultation is being undertaken during the concept planning phase of the project and will continue through the various phases of the project. • Where reasonable and practical, outcomes and concerns from the consultation process will be incorporated into project planning	•

The overview table outlines EDS objectives and provides a framework and tool for assessing how a project/action or option is contributing towards sustainability, maintaining status quo or moving away from a sustainable outcome. The table includes assessment criteria (bold) for each objective as well as principles and example actions/measures that a project may adopt during planning, design and/or construction phases. In assessing a project the assessment should be against the 'base case' or do nothing option (which may assume a certain level of existing impact).

	Reducing Sustainability (Adverse impacts) ⇦	**Neutral – Status quo**	⇨ **Enhancing Sustainability – (Positive impact)**
ESD Objective (focusing on "Attaining Sustainability")	**Guiding Assessment Criteria (Bold) and example actions/opportunities (dot points) for incorporation into project**		
Minimisation of Social Impacts of Projects and infrastructure			**Minimisation of Social Impacts of Projects and infrastructure**
	• Social impact through temporary disruption of public transportation over the course of the project.	• Project will provide, where possible, alternative means of public transportation, for example buses connecting one rail station (where construction works occurring) to another station where trains are operating. • The project aims to allow through access to all pedestrian crossings and vehicular traffic crossings during the construction phase when these crossings are not directly affected by the works.	
Contribution to the Concepts of Urban Design / Regeneration (For urban projects)	**Degrades urban character and/or contributes to community isolation**		**Contributes to improved urban environment and/or lifestyle of local community**
			• A more reliable, safe and efficient rail network will encourage public transportation use, and contribute to reducing road traffic, both of which will improve lifestyle of community.
Enhancement of Visual Amenity	**Contributes to loss or decline of Visual Amenity in area**	**No net change**	**Improvement and Enhancement of Visual Amenity**
		• This project essentially comprises critical maintenance of the track infrastructure, involving largely replacement of the current infrastructure with new infrastructure. As such there is no net change to visual amenity as part of this project.	
Preservation of Cultural Heritage	**Contributes to loss of Cultural Heritage sites/objects/areas**	**No net change**	**Ensuring conservation and protection of Cultural Heritage**
		• Checks of local, state and national heritage registers (non-indigenous) identified state & local heritage items: Belair Railway Station & Signal Box, Sleeps Hill Tunnels & Viaduct; and local heritage items: Blackwood Station and Shepards Hill Tunnel. Management measures will be implemented to protect heritage items, if required, which may include monitoring of vibration impacts in accordance with relevant standards during construction. • Checks of any recorded sites within the project area in the Register of Aboriginal Sites and Objects will occur. • Works will occur within the existing rail line/track formation, which has been extensively disturbed in the past and comprises primarily imported material. Considering this, an Aboriginal heritage survey will not be undertaken for this project.	
Growing Prosperity contribute to competitive freight transport logistics and networks			**Maximise the value of existing and future transport assets through more efficient use, targeted upgrades**
			• The principal aim of the project is the upgrade of rail track infrastructure to facilitate the delivery of a faster, sustainable and more reliable metropolitan transport network.

APPENDIX D

Communications Plan

Communication Implementation Plan
Rail Revitalisation Project

1 INTRODUCTION

1.1 Background

The State Government is providing $121m over four years to revitalise the state's metropolitan passenger rail track. This is the first step in the revitalisation of the rail network.

Delivering safe and reliable train services is the highest priority for TransAdelaide – today and into the future. The rail revitalisation project will help deliver this goal.

Over 11 million passengers use trains each year in metropolitan Adelaide, and train travel makes up 36% of public transport usage.

Noarlunga and Belair line commuters will be invited to provide suggestions on alternative means of transport, while sections of the lines are under construction. Alternative transport will be provided throughout the construction process.

This rail revitalisation includes:

- Upgrading the track on the Noarlunga line, between the Adelaide Yard and Noarlunga Centre
- Upgrading the track on part of the Belair line, between Sleeps Hill Tunnel and Belair Station
- A total of 65kms of new track will be installed and will include new base layer, drainage, new long life concrete sleepers and new rail where required.
- Making provisions for potential future standardisation, increased services frequency and electrification.
- Refurbishing / replacing turnouts and switching equipment
- Providing a track structure that can allow an increase in maximum train speed.
- Upgrading road level crossings by replacing bitumen with long life concrete.

The revitalisation will result in:

- Improved track stability which will reduce delays to train services, resulting in travel time savings to commuters
- More reliable services and enhanced passenger comfort
- Smoother road surfaces at road level crossings
- Increased patronage due to reduced travel times
- Extended life of the rail infrastructure due to concrete resleepering (concrete sleepers have a life of 60 years, compared to timber sleepers with a life of up to 30 years)
- Reduction in operational noise created by trains due to improved wheel rail interface through removal of joints
- Reduction in road congestion by 2018 as a result of the 16 million less car kilometres.
- Increased road safety in terms of less fatalities and serious injuries as a result of 16 million less car kilometres
- A reduced ecological footprint with a substantial reduction in reliance on River Red Gum timber for sleepers and a reduction of 6,000 tonnes of greenhouse gas emissions due to movement of passengers from cars to rail.

The following environmental issues will be managed as part of the Revitalisation project:

- The rail revitalisation will require closure of sections of the Belair and Noarlunga lines. Construction will occur on small sections at a time, leaving the remainder of the line open for use. Alternative transport options will be developed to replace these services, in consultation with the travelling public. Road level crossings will also be temporarily closed as required.
- Construction noise will be unavoidable given the proximity of the rail tracks to some residential properties. Care will be taken to minimise the impact of noise on residents. All construction work will be undertaken in accordance with the Environment Protection Authority.
- Removal of contaminated materials will be carefully managed and will be in line with the Environment Protection Authority.
- Where possible, material to be removed will be either reused as part of the project or recycled elsewhere (in line with the Zero Waste SA Act, 2004).

South Australia's Strategic Infrastructure Plan has identified the need to transform Adelaide's urban passenger transport system into a cost effective, environmentally sound and modern metropolitan network. Rail revitalisation will enhance the rail network and expand capacity to facilitate future growth and development.

A number of Local and State Heritage items have been identified within the rail revitalisation area. Potential impact on these items will be minimised, and will be monitored throughout the project. These heritage items include:

- Belair Railway Station and signal box
- Blackwood Railway Station
- Shepherds Hill Road Railway Tunnel, Eden Hills
- Sleeps Hill Railway tunnel, Watiparinga Reserve, Eden Hills.

1.2 Comprehensive Consultation with Stakeholders

Residents and businesses local to, or affected by, the works and TransAdelaide regular train commuters will be engaged on a range of issues, including:

- Inconvenience to train users having to use alternative transport
  - Will it make their trip longer?
  - Will it cost more?
  - If alternative transport is bus, is there adequate parking, space, etc?
  - Need to ensure that people with disabilities can use the alternative transport provided.
  - Need to identify what alternative transport the commuters want, do this by a survey distributed on the trains during the planning phase / signage at stations?
  - Need to ensure that commuters are informed of the alternative transport options in a timely and targeted manner. Information needs to be clear, concise and accurate to minimise confusion, thereby minimising possible negative media, again could inform via flyers on trains, signage at stations, TransAdelaide's SMS service.
  - Need to clearly communicate a program of works – so that people don't assume the whole line will be closed, etc.
- Effect of construction noise on adjacent residents/businesses
  - All work must be undertaken strictly within certain hours, and communicated to residents/businesses in advance.
  - Alternative accommodation should be found if noise levels at night exceed EPA guidelines, etc.
  - Delays to motorists – due to closure of road level crossings
  - Need comprehensive communication to motorists via media.

1.3 Contributing to South Australia's Strategic Plan

The project will contribute to the Strategic Plan by:

- Reducing greenhouse emissions (T3.5) - Estimated reduction in the level of Greenhouse gas emissions of 6,000 tonnes per annum compared to the base case.
- Reduce ecological footprint by reducing the impact of human settlements and activities (T3.7) - Utilisation of concrete rather than River Red gum timber sleepers
- Strategic infrastructure development (T1.21) - Costs of standardising and upgrading the network would be significantly reduced following the rail infrastructure improvements. Concrete resleepering costs will be around 20% less if carried out under this initiative than if carried out after any possible future electrification already has been undertaken.
- Increased use of public transport to 10% of metropolitan passenger vehicle kilometres travelled by 2018. (T3.6) - More reliable and safer services makes travel by train more appealing to the commuting public. Greater potential for increased frequency and speed in the future.
- Greater safety at work 40% reduction in injury by 2012 (T2.11) - The installation of new infrastructure will reduce significantly the maintenance requirements and therefore exposure of workers to injury.

1.4 Risks

A full risk management program will identify, manage and mitigate issues during the program.

2.0 CONTENT AND STRATEGIC FOCUS

2.1 Role of communication and objectives

This communication plan provides recommended strategies and responsibilities for providing information during the Rail Revitalisation project and encouraging engagement from interested parties when appropriate.

Communication efforts will focus on:

- ensuring all key interested parties are well informed about the timing, impacts and benefits of the project
- seeking input from service users who will be disrupted by works into what alternative services would best suit their travel requirements
- consultation with groups who represent local community issues – safety, environment, people with disabilities and the like
- providing factual and accurate information to the community, in particular local residents, businesses and adjacent landowners, and public transport users
- monitoring community perceptions and opinion through review of the local media and via direct liaison with the public.

This plan will be refined, and where necessary revised to ensure that it continues to reflect the philosophy set by the project and best suits the changing environment that it addresses.

2.2 Key target audiences

Category	Stakeholder
primary audiences (directly affected)	Local communities/residents adjacent to rail corridors
	Local road users
	Public transport users
	Rail operator – TransAdelaide
	Bus operators
secondary audiences (indirectly affected)	the local community (broader usage and social impacts)
	City of Mitcham, Marion, Holdfast Bay, Onkaparinga, Adelaide
	Shopping Centres/Precincts
	Education, leisure and community venues
	Hotels/Entertainment Venues
	Taxi industry
	regional road users
partners (who contribute to the delivery of the project)	Department for Transport, Energy and Infrastructure ▪ Minister for Transport, Patrick Conlon Project Team: ▪ TransAdelaide ▪ Office of the Chief Executive ▪ Office of Major Projects Infrastructure
	Local Government ▪ Local Members of Parliament ▪ Elected members
influencers of public opinion	State media sources ▪ *The Advertiser* ▪ *Sunday Mail* ▪ metropolitan television and radio
	Local media sources ▪ *Local Messenger Newspapers* ▪ *Individual Council's newsletters/magazines*
	Consultative Groups: ▪ Southern Region Transport Advisory Group ▪ TransAdelaide's Rail Customer Panel ▪ TransAdelaide's Disability Consultative Committee ▪ People for Public Transport
	Interest Groups, including: ▪ Royal Automobile Association (RAA) ▪ Public transport / disability interest groups ▪ Neighbourhood Watch

2.3 Communication Channels

A variety of communication channels and processes will be required to meet the specific needs, concerns and expectations of the target audiences.

To provide information to the general public, DTEI / TransAdelaide will rely on mass media including newspaper and radio. The public information campaign will have a focus on residents and general public that live and work around the rail corridor. Information will be posted on DTEI / TransAdelaide's internet site, including a link to the AdelaideMetro web page.
User groups and feedback opportunities will seek input from the users of our services about the alternative services that will be available during service disruption.

Community Update flyers will be distributed to the local community and interested parties to keep them informed of progress. Regular updates will be provided to the project's Community Consultation Group and Executive and Elected members of the representative councils.

Current and potential users will be surveyed about the services and facilities that would attract them to/return to train services after the Rail Revitalisation project has concluded.

3 ELEMENTS

3.1 Updates

As new information becomes available the Communications Manager, liaising with the Project's management team, will assess who might want or need the information, and the best mode of communication.

3.2 Briefings and presentations

Project information will be provided to key interested parties, including the media and the community, on request. The Communications Manager will be responsible for preparation and release.

3.3 Media

When new milestones are met in the Rail Revitalisation project, or when new information becomes available, the Communications Manager will prepare media releases for approval by the Project Sponsors.

3.4 Marketing / Promotion Rail Revitalisation activities

The marketing and provision of information about public transport services will be undertaken by the Communications Manager and Community Liaison Team, with close liaison with the Project's management team.

3.5 Publications

During the project community updates will be distributed when required detailing the latest project information, next steps, updates on timing, and where people can get further information.

There may also be opportunity to place regular updates in the local council's newsletters which is distributed to their residents.

3.6 Direct correspondence

Direct correspondence will be prepared by the Project Manager when required. The Project Manager will direct the flow of this communication to audiences and key stakeholders.

Information directly advising targeted stakeholders of impacts to traffic and rail services will be prepared and distributed Communications and Community Engagement team.

3.7 Website

A project website will be established by DTEI. Information pages on the DTEI / TransAdelaide websites will be updated as required by the Communications Manager.

3.8 Community Engagement

TransAdelaide and DTEI will consult with established user, representative and interest groups, including:

- Southern Regional Transport Advisory Group
- TransAdelaide's Disability Consultative Committee
- TransAdelaide's Rail User Panel
- Public Transport Division's Customer Representative group

3.9 Community Consultation Committee

A Consultation Committee will be established to discuss project works and facilitate information flow to the community. It is likely one will be established for each stage of the works.

The group will:

- create a forum for discussion and exchange of information on topics related to the detailed design and construction phases of the project
- assist the project team to identify local issues related to the project that will be considered in the detailed design and construction phases of the project
- input into alternative service offering during the project and to service/facilities to be provided upon return to full-service at completion of the project
- act as a two-way communication link between the project team and the community and interested parties during construction works.

The group will comprise community representatives, nominees of Councils, and representatives of DTEI and TransAdelaide. Specialist consultants will be made available where input and advice is required. The Project Manager will be an ex officio member. The committee will determine the frequency of meetings.

3.10 Contact details for further information

A project telephone number, email and web addresses will be promoted widely in all elements of the communication plan.

These facilities will be administered by the Communication & Community Liaison team to provide a gateway for the public to obtain information about the project and to allow opportunity to give input.

3.11 Plans, photographs and artists impressions

To assist users and local residents to understand the works and the impact on their services and community, graphics will be widely used. This may take the form of artists impressions giving 'before' and 'after' views of aspects of the work.

4 COMMUNICATION PROGRAM

Milestone	Activity	Topic	Type of Engagement
Prior to 31/12/2007	Establish project telephone number, email and website addresses	Public contact	
Prior to contract announcement	Website created Surveying current users	Project brief/ communication options Suggestions for alternate services during works; what services upon re-open	Information and feedback opportunity Surveying
Contract awarded, consultation and design phase commences	Community Newsletter Communication with key interested parties and affected residents/businesses (including current public transport users)	Contract award, alternate services, disruption information/ minimisation	Information Community Engagement sessions
At key milestones	Website updated throughout project	Various	Information
Prior to start of works	Advice to broader community regarding impacts of works on crossings	Level crossing traffic impacts	Information – Website and Messenger Advertisement
Prior to start of works	Advise local community of environmental factors and temporary impact	Noise, dust, environment	Consultation
Prior to start of works	Consult with users on alternatives for substitute services during line closure	Alternate services	Consultation
Prior to works	Issue Community Newsletter	Updating the community on progress of the works	Information
As required	Media release	Traffic disruptions, detours and delays Commissioning and re-opening of line.	Information
As required	Issue Community Newsletter	Updating the community on progress of the works	Information
As required	Advertisement	Traffic disruptions, detours and delays	Information
As required	Letter to local residents and businesses	Traffic disruptions, detours and delays	Information
On completion	Community engagement evaluation. Assessment of: ▪ effectiveness informing interested parties and community ▪ effectiveness of engaging interested parties and community ▪ effectiveness of involving interested parties and community	Assessment of community engagement to meet engagement objectives and compliance with standards and guidelines	Information