

22. JUSTIFICATION AND CONCLUSION

22.1 Cumulative and strategic impact assessment

Cumulative impacts are likely to arise from the interaction of the construction and operation of the SSFL and other proposed activities, locally and regionally. Freight related activities and proposals and other developments planned within the local area and within southern Sydney are outlined in Section 2.4 and 2.5. It is against these activities that the cumulative social, economic and biophysical impacts have been assessed. In particular, the cumulative impacts of the SSFL have been addressed in the context of proposed rail improvements generally in southern Sydney and the urban and other development that has been identified for the South West Sector of Sydney.

Table 22.1 provides a strategic assessment of the likely cumulative impacts of the SSFL. The interactions of effects to the social, economic or biophysical environment have been derived from the environmental assessment in previous Chapters.

Table 22.1 Strategic assessment of cumulative impacts

Interaction	Assessment
Social Environment <ul style="list-style-type: none"> • Public access and severance • Distribution of benefits • Changes to amenity <ul style="list-style-type: none"> - air quality - noise - character • Public safety • Aboriginal and built heritage 	<p>Proposed developments in the vicinity of the proposed SSFL that may coincide with the construction phase include:</p> <ul style="list-style-type: none"> • Mixed use 2 to 3 storey development on the western side of Macarthur Railway Station • Residential subdivisions to the south and north of Glenfield Railway Station • Proposed South West Rail Link from Glenfield to Leppington • Proposed intermodal freight terminals located south of Minto, Ingleburn, Moorebank, Menangle Park and Enfield • Redevelopment of Sefton town centre, including mixed use development and streetscaping. <p>There would be short-term disruption to access to six stations during construction. Construction activities at bridges may cause short-term disruption to local access across the rail corridor.</p> <p>After construction, local access to and through stations would generally be improved – Warwick Farm and Minto would have improved easy access provisions. All other local access would be maintained.</p> <p>Proposed improvements to freight and passenger transport infrastructure within southern Sydney would lead to cumulative, improved regional access.</p> <p>The SSFL would improve passenger rail reliability by separating freight from passenger services.</p> <p>There would be an uneven distribution of community benefits within the region, and nationally. There would be a disbenefit to people located adjacent to the SSFL, while others would benefit from a cumulative improvement in the built environment, traffic and air quality.</p> <p>The cumulative impact of development within southern Sydney would result in changes to the amenity within the region. The cumulative impacts of development within southern Sydney are likely to be diminished air quality, increased noise and altered local and regional character. The SSFL's contribution to this cumulative impact is small, and may contribute to an improvement in some aspects (e.g. regional air quality).</p> <p>There would be adverse changes to local amenity resulting from the SSFL, particularly in relation to air quality and noise. There may be some changes to local character as a result of the SSFL project in relation to embankments and permanent noise barriers. The flyover north of Glenfield would significantly change the visual character at this location.</p>

Interaction	Assessment
	<p>The SSFL would be expected to assist in reducing road-based freight movements, and in turn, improve amenity and public safety on a national basis.</p> <p>Development within southern Sydney is likely to result in cumulative loss of historical and indigenous heritage. The SSFL would result in alterations or removal of several heritage rail footbridges. There is no known impact on indigenous heritage, although further assessment is recommended. The contribution of the SSFL to the cumulative impact would be small.</p>
<p>Economic Environment</p> <ul style="list-style-type: none"> • Direct user savings (reduction in freight and transport costs) • Employment • Induced development/change in land use • Demand for materials • Cost of infrastructure development and maintenance 	<p>The improvement of rail and other infrastructure would lead to reduction in freight and transport costs, and cumulative economic benefits, regionally and nationally. The SSFL would contribute to this economic benefit.</p> <p>Growth and infrastructure development would improve local, regional and national employment opportunities, and encourage further development and changes in land uses. The cumulative economic impacts of changes within southern Sydney are expected to be beneficial.</p> <p>There would be an increased demand for resources as a result of the development of the SSFL and development generally. The contribution that SSFL makes to resource depletion is relatively small as fuel use (per gross tonne kilometre) during operations is efficient.</p> <p>The cost of infrastructure and maintenance can be offset by the economic benefits that accrue.</p>
<p>Biophysical Environment</p> <ul style="list-style-type: none"> • Loss of biodiversity • Effects on water quality and supply • Greenhouse gas emissions • Change in scenic quality 	<p>Development in southern Sydney would lead to cumulative loss of biodiversity. SSFL would require the loss of 1.3 hectares of Leacock Regional Park at Glenfield, of which 0.4 hectares is a degraded Endangered Ecological Community, Cumberland Plain Woodland. In addition the SSFL would result in the removal of 1.7 hectares of Sydney Coastal River Flat Forest, (Endangered Ecological Community) from partly within the rail corridor at Bow Bowing Creek (north of Narellen Road), south of Casula, Cabramatta Creek, Cabramatta and Prospect Creek, Carramar. There may be some loss of degraded habitat that may support threatened species.</p> <p>Cumulative impacts on water quality and supply would result from development within southern Sydney.</p> <p>With the application of mitigation measures, the SSFL would not result in significant changes to water quality or hydrological systems. There would be some changes to Bow Bowing Creek at Macarthur and a drainage channel near Glenfield Road at Glenfield Junction as a result of the SSFL project.</p> <p>The proposed development within southern Sydney would result in increased greenhouse gas emissions. The SSFL would improve efficiency of freight movement by reducing road-based freight movement and offset greenhouse gas emissions by reducing emissions by up to 235 to 245 tonnes per year by 2018.</p> <p>There would be a significant change in scenic quality within southern Sydney. SSFL would result in some local changes to scenic quality, particularly at the flyover north of Glenfield. With the application of mitigation measures, some improvements to scenic quality would be expected.</p>

Southern Sydney is forecast to have a high rate of population growth and development. This includes urban and industrial development and associated road and rail infrastructure development. The cumulative social, economic and biophysical impacts of this development are significant. However, the contribution that the SSFL would make to the cumulative impact of this development is relatively small. In some cases the SSFL would reduce cumulative impacts, by providing benefits, in particular to access, economic development and employment, and greenhouse gas emissions.

It is likely that construction of the SSFL would coincide with the construction one or more of the developments listed above. As the precise timing of the construction of these developments is not known the cumulative construction impact cannot be quantified. ARTC and the construction contractor would take account of these developments and likely timing during development of the detailed construction planning in order to manage and minimise potential cumulative impacts.

22.2 Measurable economic benefits

ARTC has undertaken an economic evaluation of the Southern Sydney Freight Line in the context of the overall economic evaluation of the North-South Corridor (ARTC, 2005). The results of the economic evaluation are discussed below.

22.2.1 Approach to economic evaluation

The economic evaluation of the SSFL has been undertaken in the context of the overall evaluation of the North-South Corridor. It is not possible to separate the proposal from the overall corridor improvement program as it is an integrated suite of projects which collectively seek to achieve the same project objectives in terms of improving efficiency and cost competitiveness of rail freight between Melbourne-Sydney-Brisbane.

The economic evaluation has been undertaken using the standard cost-benefit analysis approach adopting the following assumptions:

- Total resource costs have been estimated for the Investment Case and the Base Case.
- Where available, observed prices are assumed to represent the resource costs involved.
- A perfectly competitive market is assumed for above-rail operations. This implies that all cost reduction and service improvement benefit is passed onto the end market.
- Revenue transfers have been excluded, except where user benefits are internalised by the producer.

Two mode share models have been used to provide lower and higher mode scenarios. These are discussed in more detail in **Chapter 2**. Both these scenarios have been modelled using a cost-benefit analysis.

22.2.2 Description of economic benefits

Economic benefits arise from three major categories:

- A net reduction in resources required to achieve the same movement of freight (referred to as operating costs in this analysis). These can be directly calculated and include savings in terms of rail operational costs (including rolling stock utilisation), cost of pick-up and delivery of containers and cost differential of moving freight by road.
- An increase in service quality for both existing freight and for diverted freight (referred to as non-price customer benefits). This considers cost savings associated with improved reliability and service availability.
- A net reduction in external costs (referred to as externalities). The externalities are indirect benefits related to the social benefits arising from the shift from road to rail transport. These include a reduction in traffic accident frequency, reduced noise pollution in urban areas, and environmental benefits such as air pollution and greenhouse gases.

There are other economic benefits that cannot be directly measured such as the passenger train benefits. These relate to instances where freight services may disrupt and delay passenger services due to failures or late running. The SSFL provides the ability for passenger and freight services to operate independently, significantly reducing the risk of these delays. These benefits have not been quantified in the analysis and therefore the analysis to some extent underestimates the overall economic benefit.

The results of the economic analysis for the overall north-south corridor improvement program are set out in **Table 22.2**.

Table 22.2 Key results of economic analysis for the North-South Corridor investment

	Net Present Value Capital Cost	Net Present Value Benefit	Net Present Value	Benefit-Cost Ratio
Low Case	\$606 million	\$1,202 million	\$454 million	1.78
High Case	\$606 million	\$1,754 million	\$1,148 million	2.59

Notes:

1. The evaluation has been undertaken over a 30 year period based on advice from DOTARS on the period used for the economic evaluation of road projects.
2. A discount rate of 7% has been adopted.
3. Capital costs are as developed by ARTC for its budget purposes and are cash-flowed across three years in accordance with current expected timing of expenditure.
4. A residual value for the projects comprising the Investment Case has been calculated based on an assumption that they have a 100 year economic life.

Source: ARTC, 2005

The net economic value of the measurable benefits of the North-South Corridor Strategy, at a real interest rate of 7 percent, would be at least \$454 million and possibly as high as \$1.15 billion. The ratio of measurable benefits to costs range from 1.78 to 2.59 for the low and high estimates respectively. (ARTC, 2005).

The SSFL is an integral part of this North-South Corridor Strategy. This strategy has been developed as an integrated whole and the financial and economic performance of the individual projects within the strategy is not readily separable in a meaningful way. This primarily arises from two factors.

First, some projects are interdependent. For instance, the SSFL is aimed at eliminating the constraints associated with entering and exiting the Sydney metropolitan area during the passenger peak curfew periods. This will result in the preferred point at which overnight trains cross moving from the double-track section north of Junee, to the single track section further south. This is interdependent with the passing lanes investment which will improve train crosses south of Junee and ensure that the benefit of the SSFL is not offset by additional crossing delays. Similarly, the ability to make best use of the SSFL is interdependent with the transit time reductions being achieved through various upgrades. These interdependencies mean that it is not possible to apportion performance improvements to individual projects.

Second, elasticities are non-linear. This means that the total benefit of the strategy is greater than the combined benefits of the projects if they could be analysed in isolation. A stand-alone analysis (if the individual performance improvements could be isolated) would not reflect the full contribution of the project to the achievement of the strategy as a whole.

Given these factors, ARTC considers that the economic benefit of the SSFL can and should be considered to be equivalent to the benefit of the North-South Strategy as a whole, that is, to be in a benefit/cost ratio range of 1.78 to 2.59.

22.3 Justification of the proposal

This section provides the justification for the proposed SSFL. In particular the justification is based on the proposal's ability to meet the project objectives that were developed to address the identified needs, as outlined in **Chapter 2**. A set of primary and secondary objectives for satisfying the strategic need have been developed. The primary objectives can be viewed as explaining "what needs to be done" while the secondary objectives explain "the best way to achieve the primary objectives".

Justification has also been considered in the context of the four principles of ecologically sustainable development which are listed in **Chapter 1**.

22.3.1 Primary project objectives

In relation to reliability and efficiency:

- Improve reliability and travel times for rail freight services between Melbourne–Sydney–Brisbane.

The reliability and travel times of freight services between Melbourne, Sydney and Brisbane would improve as a result of the construction and operation of the SSFL.

SSFL is one of an integrated suite of projects proposed to upgrade the north-south rail freight corridor, as outlined in **Section 2.3.1**. It is the largest single upgrading project proposed.

The SSFL would provide the ‘missing link’ to create a dedicated freight line between Melbourne and Sydney, removing 30 kilometres of shared freight and passenger line between Macarthur and Sefton. This would allow freight movements to operate independently of passenger services and remove the inefficiencies created by the current restrictions at times of peak passenger movements in the morning and afternoon.

It is considered that a transit time in the order of 11 hours from Dymally, Melbourne to Chullora, Sydney is necessary to meet market demand for travel efficiency. The current transit time is 13 hours.

It has been estimated that travel times for freight between Macarthur and Sefton would be decreased by approximately 10 minutes. However, with efficiencies gained from the removal of conflicts with passenger services, and the upgrade of the Melbourne to Sydney freight line, the proposed infrastructure will achieve a transit time on the Melbourne to Sydney corridor in the order of 10 hours 40 minutes if operated with a 1,500 metre train at current average freight density. A 1,800 metre train will have a transit time in the order of 11 hours 30 minutes.

In relation to rail competitiveness:

- Improve rail freight service competitiveness compared to road freight service.

The competitiveness of rail freight services would be improved compared to road freight services. This would be achieved by the reduction in transit time discussed above.

In relation to operations:

- Reduce delays to passenger services resulting from conflicts with freight operations.

The operation of the SSFL would reduce delays to passenger services resulting from conflicts with freight operations. The SSFL would be a dedicated line for movement of freight, and would capture the majority of freight movements between Macarthur and Sefton, although freight operators may choose to use the passenger lines for convenience.

In relation to economic development:

- Support State and national economic development with provision of key freight infrastructure.

The SSFL is part of a program of improvements to rail freight infrastructure on the eastern seaboard of Australia that would support economic development within NSW and nationally. ARTC was established following an inter-governmental agreement to facilitate a commercially viable Australian rail freight industry through the introduction of new infrastructure and freight operator access arrangements, contributing to an efficient national transport system. Improvements to the north-south rail corridor from Melbourne to Brisbane via Sydney provide an opportunity to shift freight market share from road to rail. In particular, rail performs worse than road freight in relation to availability, reliability and price. The SSFL and associated rail improvements would substantially improve the service dimensions and increase the market share of freight movement from road to rail.

The strategic rail and freight context is detailed in **Section 2.1.1**.

22.3.2 Secondary project objectives

In relation to environmental sustainability:

- Enhance potential beneficial environmental effects and manage potential adverse environmental effects by:
 - Conserving biological diversity and ecological integrity
 - Eliminating the threat of serious and irreversible environmental damage
 - Improving air quality and reducing greenhouse gas emissions
 - Minimising use of energy and non-renewable resources
 - Minimising construction and operational related impacts on the local community.

The SSFL has been developed to minimise impacts on native species and communities. The SSFL is largely contained within the existing RailCorp boundary and adjacent to existing rail infrastructure. These areas are generally highly disturbed and degraded. The impact on biological diversity and ecological integrity are not considered significant. Nevertheless, the SSFL would remove 0.4 hectares of Cumberland Plain Woodland, and 1.7 hectares of Sydney Coastal River Flat Forest. Both these communities are listed in the *Threatened Species Conservation Act 1997* as Endangered Ecological Communities. There may be some loss of degraded habitat that may support threatened species.

The alignment and design of the SSFL would not pose any threat of serious and irreversible damage to the environment.

There would be a reduction in the generation of air pollutants and greenhouse gas emissions as a result of the operation of the SSFL. The projected shift of freight from road to rail in 2018 across the North-South Corridor would result in a net reduction of up to 235 to 245 tonnes per year of carbon dioxide contributing to regional air quality benefits.

There would be a local increase in the emissions of air pollutants adjacent to the SSFL as a result of increased movements of diesel-fuelled freight engines. These emissions would generally not result in air pollutants that exceed government criteria. However, there may be a marginal exceedance of the annual average nitrogen dioxide goal of 62 micrograms per cubic metre within a distance of 50 metres of the rail corridor by 2018. The forecast growth in train movements overstates the direct contribution of the SSFL to air quality exposure, as discussed in **Section 13.14**.

Improvements in the efficient movement of freight by rail will reduce the use of energy and non-renewable fuel resources. The projected shift in the movement of freight from road to rail across the North-South Corridor will lead to a decrease in diesel fuel use of 78,330 to 81,780 litres per year in 2018.

Construction and operational related impacts on the local community would be minimised by the application of mitigation measures. Construction activity would result in short term and intermittent impacts on the local community, including noise, dust and visual intrusion. Specific mitigation measures would be implemented during construction. The operation of the SSFL would result in improvements to current and future rail freight noise experienced by most residents adjacent to the SSFL. This would result from application of mitigation measures and improvements to rail freight infrastructure.

In relation to economic and financial outcomes:

- To achieve acceptable economic and financial outcomes.

An economic evaluation undertaken by ARTC (2005) estimates that the measurable net economic benefits of the North-South Corridor Strategy, at a real interest rate of 7%, would be at least \$454 million and possibly as high as \$1.15 billion. The ratio of measurable benefits to costs range from 1.78 to 2.59 for the low and high estimates respectively.

There are also indirect economic benefits associated with intangibles such as the reduction in delays to passenger services from independent operation of freight services along the SSFL.

22.3.3 Ecologically sustainable development

Justification of the proposal against the principles of ecologically sustainable development is provided below:

- *The precautionary principle*: the proposal is needed for strategic, operational and environmental reasons. It is a prudent approach to resolving the issues underlying the need for the proposal, in a way which minimises impacts on the human, built and natural environment. There is no threat of serious and irreversible environmental damage as a result of the SSFL.
- *Intergenerational equity*: the proposal would provide a more efficient rail freight network which would accommodate projected interstate freight movement demands over the next 20–30 years. There would be some changes to local amenity as a result of some changes to the noise environment in the longer term, and local changes to the urban, visual and air environment.
- *Conservation of biological diversity and ecological integrity*: The proposal would be largely constructed within an existing railway corridor therefore minimising the potential for impacts on biological diversity.
- *The improved valuation and pricing of environmental issues*: consideration of environmental issues in the early stages of project planning has helped achieve improved consideration of environmental resources by ensuring that these issues were considered in the strategic planning and establishment of the need for the proposal.

22.4 Conclusion

The proposed Southern Sydney Freight Line would provide significant economic, social and environmental benefits. The key benefits arising from the project are:

- A significant improvement in availability of freight services through Sydney improving the cost-effectiveness of rail compared to road transport on the Melbourne-Sydney-Brisbane corridor.
- Reduced delays to passenger services caused by freight operations, by providing a dedicated and independent rail line for freight services.
- A reduction in the growth of road freight traffic within the Sydney metropolitan area and along major highways linking Melbourne-Sydney-Brisbane. This would reduce future road infrastructure costs and also have environmental and road safety benefits for communities along these highways.
- Flow-on benefits to the overall economy through more efficient and cost-effective transport of freight and improved freight transport infrastructure for the Sydney region. The project will deliver on the objectives contained in the NSW Government's Metropolitan Strategy for Sydney to facilitate the upgrading of the metropolitan rail freight network and to maximise the efficiency of freight transport and the proportion of freight transported by rail.
- Reduced consumption of non-renewable diesel fuels for each gross tonne kilometre of freight on rail compared to alternative road haulage contributing to regional air quality.
- The proposal is complementary to other freight initiatives including the recently approved Port Botany expansion and proposed and existing intermodal facilities in southern Sydney. The NSW Freight Infrastructure Advisory Board has acknowledged that its strategy for promoting the development of intermodal terminals across south western metropolitan Sydney is dependant on the successful completion of the SSFL (Freight Infrastructure Advisory Board, 2005).
- Upgrading of passenger facilities and precinct amenity at six railway stations – Leumeah, Minto, Casula, Warwick Farm, Cabramatta and Sefton.

Against these benefits are a number of predicted environmental impacts including:

- Disruption during the two year construction phase with associated noise and traffic and other amenity related impacts.
- Increased noise levels for a number of properties along the rail corridor due to the increase in freight train movements. Noise barriers are proposed to mitigate operational noise levels to meet DEC noise criteria.
- A marginal reduction in air quality for properties close to the rail line associated with increased diesel emissions.

The construction and operation of the SSFL would substantially meet the adopted project objectives. These objectives have been developed to ensure that improved reliability and efficiency of freight services along the eastern seaboard, and the resulting economic benefits that would accrue, are coupled with beneficial economic and environmental effects and management of potential adverse environmental effects. The proposal is also justified in terms of the principles of ecologically sustainable development.

The potential environmental impacts have been assessed and it is considered that with the adoption of proposed environmental management measures and safeguards proposed by ARTC they can be adequately mitigated and managed.